### PRELIMINARY ASSESSMENT

at the

### **Rahway Arch Properties Site**

Block 9.03, Lot 21; Block 10, Lots 8-10 and 12-21 and Block 11.01, Lots 8, 10-14 and 28

Carteret, New Jersey

Report Issued: August 7, 2012

prepared for:

Rahway Arch Properties, LLC

Rahway Arch

7 Nottingham Drive Florham Park, New Jersey 07932

prepared by:

EastStar Environmental Group, Inc.

10632 Little Patuxent Parkway Suite 106 Columbia, Maryland 21042

approved by:

Albert P. Free, P.E. CSP, LSRP LSRP Number 575600 President

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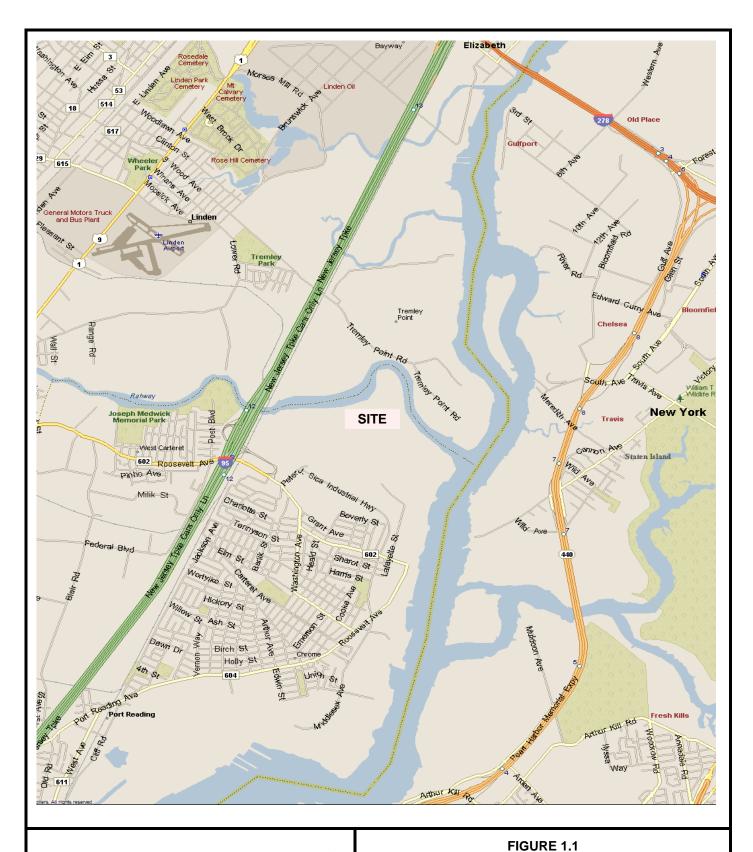
### 1. INTRODUCTION

Rahway Arch Properties, LLC has contracted with EastStar to provide LSRP services for remediation of the Rahway Arch Properties site in Carteret, New Jersey. The site is a 124.7 acre property located at the terminus of Driftway Street. It is more precisely defined as Block 9.03, Lot 21; Block 10, Lots 8-10 and 12-21 and Block 11.01, Lots 8, 10-14 and 28. The general location of the site is shown on Figure 1.1. The specific location of the site and its boundaries are shown on Figure 1.2. The most recent USGS quadrangle map of the site and vicinity is shown in Figure 1.3. The property boundaries with the block and lot lines is shown in Figure 1.4.

Remediation of the site is being performed in accordance with the requirements of the Site Remediation Reform Act (SRRA), the Administrative Requirements for Remediation of Contaminated Sites (ARRCS) {NJAC 7:26C} and the Technical Requirements for Site Remediation (Tech Rule) {NJAC 7:26E}. Rahway Arch Properties opted-in to the Licensed Site Remediation Program on December 5, 2011 by submitting the LSRP Notification of Retention or Dismissal form to New Jersey Department of Environmental Protection (NJDEP). Albert P. Free of EastStar was retained as the Licensed Site Remediation Professional (LSRP) for the site.

Remedial activities have previously been performed on this site and a restricted use No Further Action (NFA) letter was issued by NJDEP in September 2002. However, the current conditions on the site are no longer protective and additional contamination and areas of concern have been identified that were not known when the NFA was issued. In addition, the site does not meet the intent of Section 47g (1) of SRRA because no portion of the site is usable for future development or recreational use.

This report comprises the Preliminary Assessment (PA) for the property and was prepared in accordance with the Tech Rule and NJDEP guidance documents. Previous assessments and investigations of the site have been used in preparing this PA, as noted in this report. The list of documents reviewed in preparation of this PA is contained in Appendix A.





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## General Location Map of the Rahway Arch Site

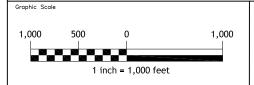
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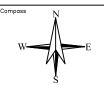




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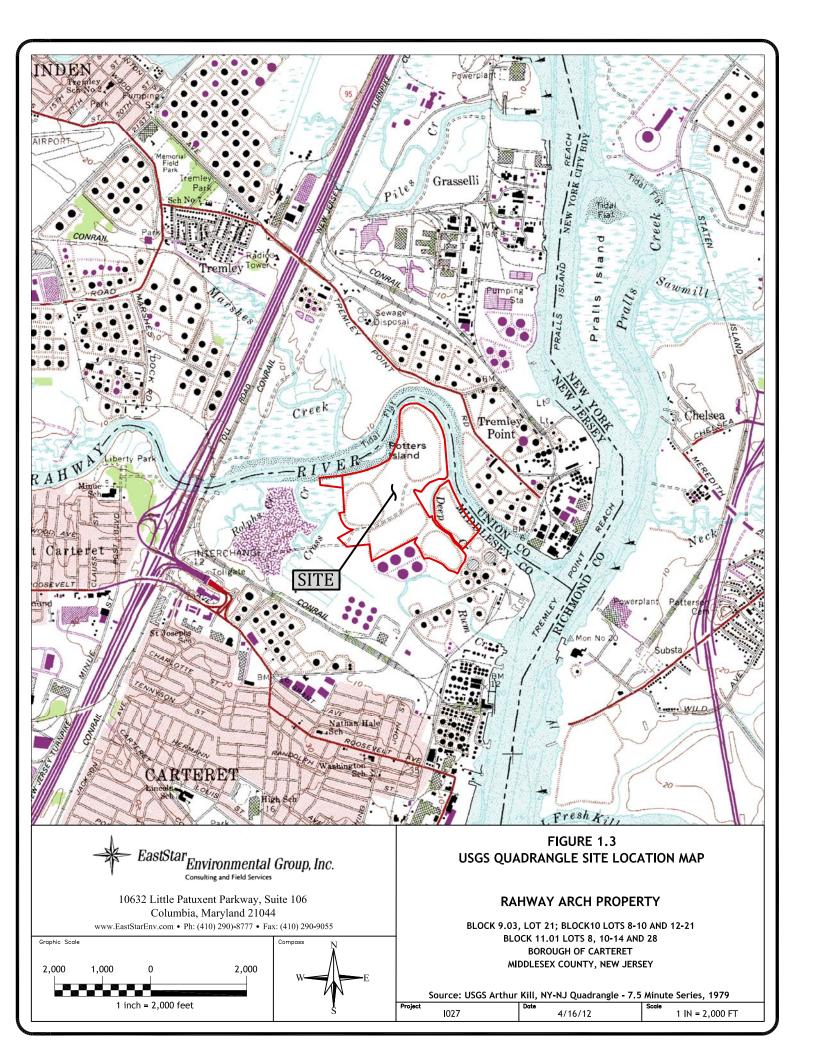


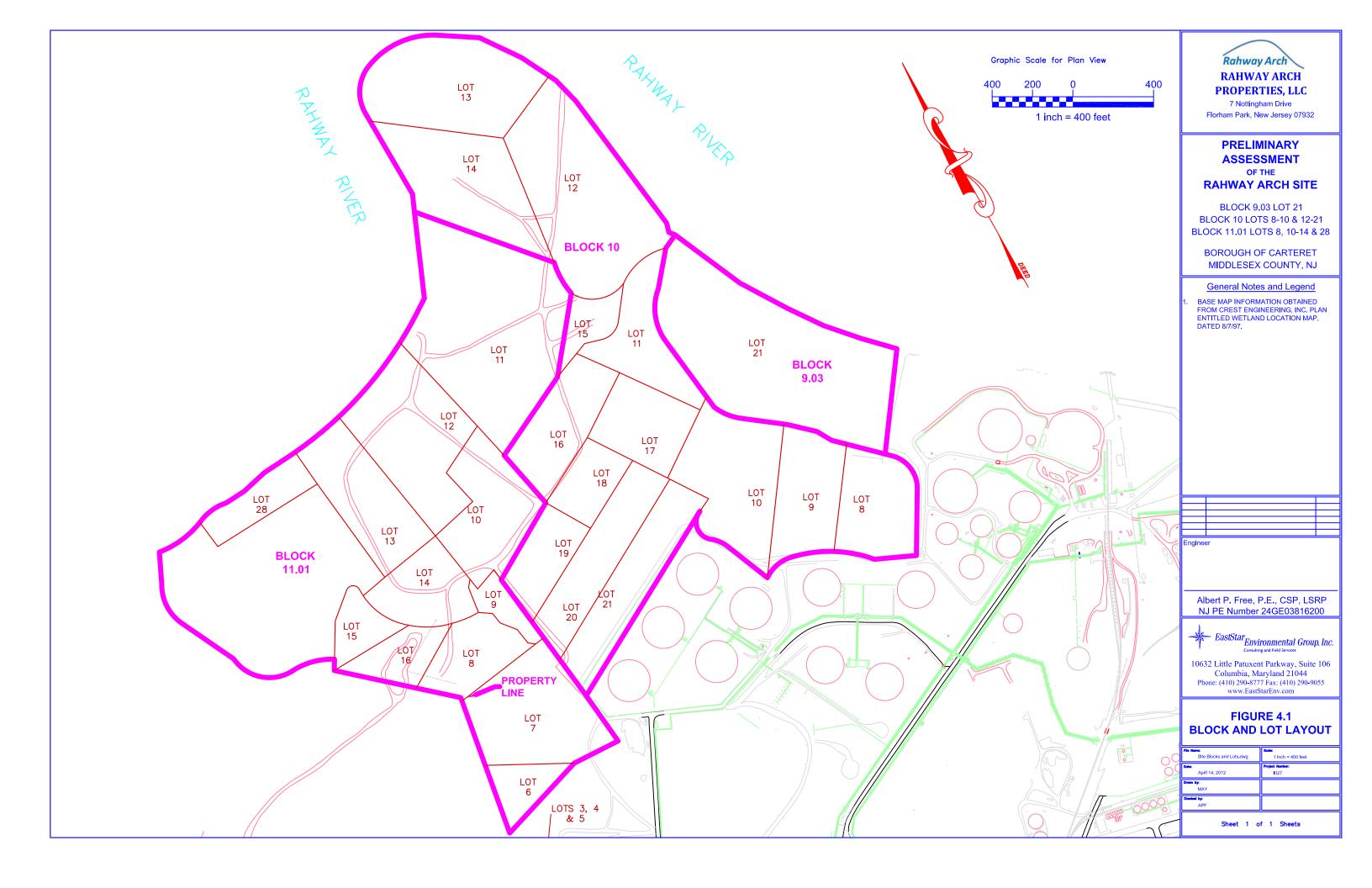
### **RAHWAY ARCH PROPERTY**

BLOCK 9.03, LOT 21; BLOCK 10 LOTS 8-10, 12-21 AND BLOCK 11.01 LOTS 8, 10-14 AND 28 **BOROUGH OF CARTERET** MIDDLESEX COUNTY, NEW JERSEY

Source: Google Imagery, 2011

4/16/12 1 IN = 1,000 FT 1027





### 2. SITE HISTORY

### 2.1 Historic Site Use

The project site is the old Cytec Impoundments site, a former industrial waste disposal facility operated by American Cyanamid Company (now Cytec Incorporated) from the mid-1930s through 1974 to dispose of a mixture of acidic sludge from an alum manufacturing process and alkaline sludge from a yellow prussiate of soda (YPS) manufacturing process.

American Cyanamid Company owned and operated a chemical manufacturing plant, known as the Warner Plant, located on 30 acres of property in Tremley Point, at the confluence of the Rahway River with the Arthur Kill in Linden, New Jersey, from 1917 to 1998. The plant produced a number of organic and inorganic products including:

- □ "Ammo-Phos" a concentrated fertilizer made by reacting ammonia with phosphoric acid. The ammonia was produced by reacting calcium Cyanamid and steam. The phosphoric acid was produced by mixing sulfuric acid with phosphate rock.
- Ammonia and nitric acid for military purposes during World War I
- Alum and aluminum sulfate compounds for water treatment
- Yellow prussiate of soda (YPS)
- Sulfuric acid, acrylamide, polyacrylamide and sodium hydrosulfide
- Paper treatment chemicals
- Mining and ore production chemicals
- Non-persistent organophosphate insecticides including malathion and Cygon
- A broad range of organic chemicals including surfactants, rubber accelerators, motor oil additives and fumigants (hydrocyanic acid)

The Warner plant was remediated under an Administrative Consent Order with NJDEP issued August 23, 1990. According to the U.S. EPA human exposures and migration of contaminated groundwater are considered to be under control at the Warner plant at this time.

While it was operating, waste alum and YPS sludges from the Warner plant were slurried and pumped across the Rahway River to the project site. It is not known if any other waste products from the Warner Plant were included in the slurry. Demolition debris from work performed at the Warner Plant were used on the project site for road and berm reconstruction.

Alum production consisted of digesting bauxite ore with sulfuric acid. The resulting acidic sludge was primarily silica. YPS production consisted of reacting calcium cyanide with hydrated ferrous sulfate and soda ash. The resulting basic sludge was primarily calcium carbonate and contained cyanide salts. The two waste streams were mixed together to form a neutral slurry and were pumped into the impoundments for disposal. Surface water from the

Arthur Kill was used to liquefy the slurry for pumping. River water was also pumped to the site between discharges to prevent sludges from settling in the pipeline. It is not known whether other waste streams or materials were blended with the sludges prior to disposal. YPS sludge disposal at the site ended in 1970. Alum sludge disposal ended in 1974.

The 124.7 acre site contains six impoundments, encompassing approximately 85 acres, located on the Rahway River. The impoundments were constructed above existing grade with wooden and earthen dikes. They contain approximately 2,000,000 tons of the cyanide containing alum-YPS sludge. The size and capacity of each of the impoundments varies, as does the thickness of the sludge, which ranges from 5 to 20 feet. A scaled site map showing the location of the six impoundments is provided in Figure 2.1.

Evidence indicates that undocumented fill material has been imported and used on the site over the years to maintain the dikes and to stabilize the surface in several of the impoundments. This fill material was imported from various sites over the years for operations and maintenance of the disposal areas. Because it was imported to the site for the operations of the impoundments, the fill may not be considered historic fill, as defined by the Tech Rule. However, the fill has the physical and chemical characteristics of historic fill.

From the time that waste from the Warner Plant was no longer placed in the impoundments, until 2005 the site was unused. Various activities were performed during that time to maintain the berms, prevent nuisance dusting, characterize the environmental conditions and monitor the groundwater. These activities are described in the next section of this PA.

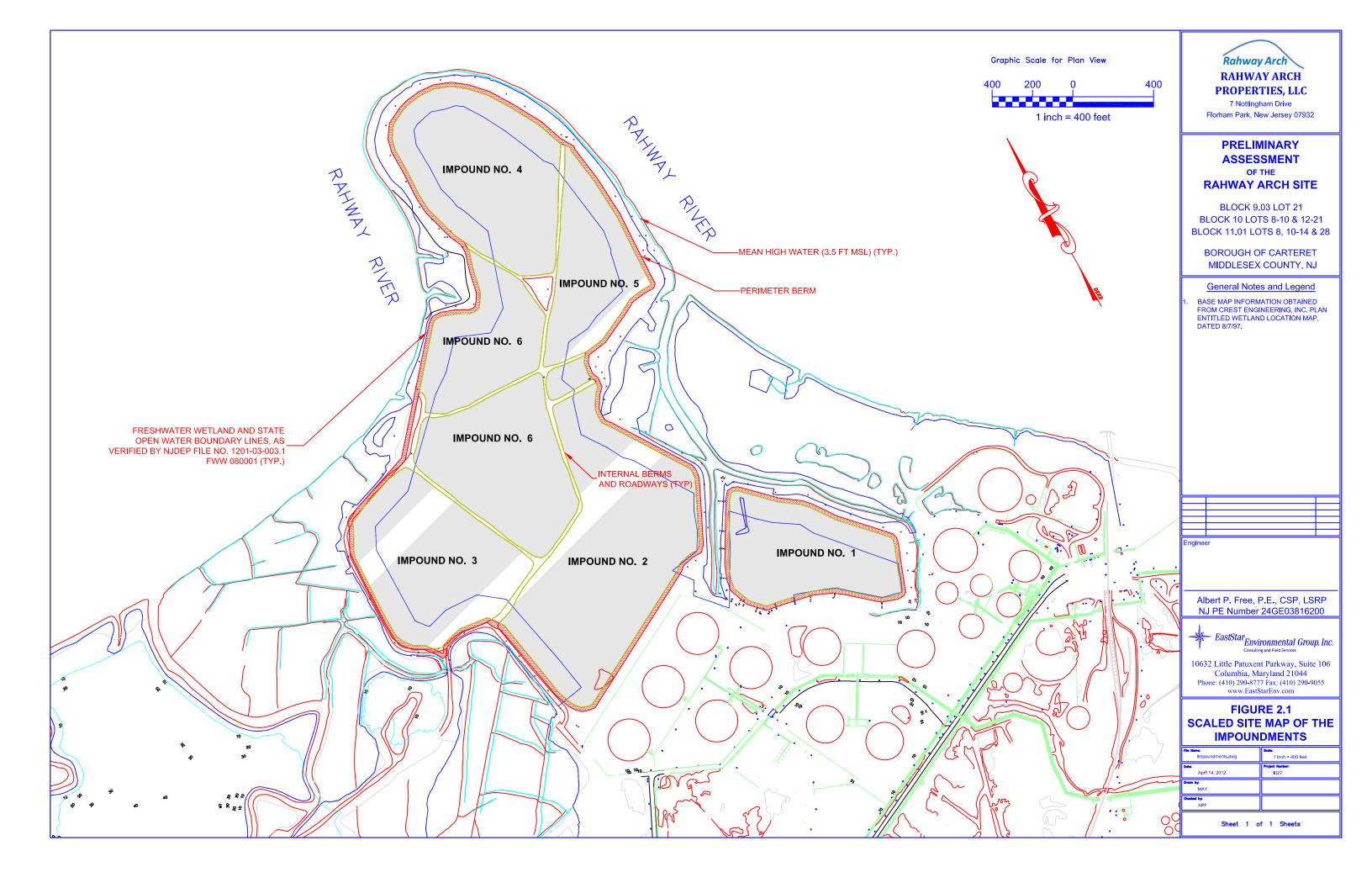
In 2005, a portion of the site in Impoundment 2 was leased by Dauman Recycling Company to operate a Class B recycling facility for wood waste and pallets. Dauman operated on the site from 2006 through 2008. Several permit violations related to improper storage and handling on the wood waste were recorded, as shown in Table 2.1. Two of those violations are still pending. Several piles of wood waste remain on Impoundment 2, and the surface of some areas of Impoundment 2 is covered with wood chips.

### 2.2 Investigation Background

### 2.2.1 U.S. Environmental Protection Agency

The site has been the subject of several environmental investigations by the U.S. Environmental Protection Agency. The U.S. EPA placed the site on CERCLIS in 1990, CERCLIS EPA ID Number NJD986603439. According to a web search, a preliminary assessment was completed in January 1991 and site investigation was completed in September 1992. Both studies indicated a low priority for further assessment. No documents were obtained during the site document search to support this conclusion.

In October 2007, a site re-assessment was performed by NJDEP for EPA. This re-assessment reviewed several previous documents prepared regarding the site. Contaminants, including cyanide, heavy metals, base-neutral semi-volatile organic compounds and volatile organic compounds, were identified. However, the re-assessment determined that the site did not



# TABLE 2.1 – VIOLATIONS FROM DAUMAN RECYCLING COMPANY WOOD WASTE RECYCLING FACILITY

## Enforcement Actions Issued To DAUMAN RECYCLING CNTR INC -

Program Interest ID: 132308 and Discovery Activity Number: BCI 080001

Feb 28, 2012 08:25

Program: Solid Waste

7/2000; Water Supply (limited information for Safe Drinking Water and Water Allocation) - 7/2000; Lab Certification (limited information) - 7/2000; Right To Know - 11/2000; TCPA - 12/2001; Land Use - 12/2001; DPCC - 1/2002; Solid Waste - 1/2002 and Pesticides - 4/2002; Site NOTE: The information contained in this report will be limited to the date each program began using the Department's integrated database, Remediation - 3/2003 and Radiation (limited information) - 7/2006. For complete information prior to these dates, please submit an official OPRA request form to the Department. If printing this report, select landscape orientation. For a list of terms and definitions, click on the NJEMS. The programs began using the system for this information as follows: Air - 10/1998; Hazardous Waste - 1/2000; Water Quality following link:http://www.state.nj.us/dep/infoview/enforcement.html

violation information was determined. Errors or omissions in the factual basis for any violation may result in a future change in classification Disclaimer: All listed enforcement actions address alleged violations based on facts and information known to the Department at the time the as a violation when such information becomes known. Persons cited for violations may contest the Department's enforcement action or penalty assessment. The resultant final decision may uphold, negate or modify the original violation findings or penalty.

Activity Number: PEA 080001

Document Type: NOV

Amount Received	N/A
Penalty Assessed	N/A
Current Document Status and Date	Effective 10/3/2008
Effective Start Date	9/25/2008

materials, remained on site in al.

qualify for the National Priorities List (NPL). The EPA issued a no further remedial actions planned (NFRAP) status based upon the existing information.

### 2.2.2 NJ Department of Environmental Protection

After the site closed in the 1970s, one of the primary concerns was windblown dust from the dried alum/YPS sludge impacting visibility on the nearby New Jersey Turnpike. An Amended Consent Judgment was issued by the Superior Court of New Jersey in 1978 to investigate stabilization of the sludge. Growing a vegetative cover over the alum/YPS sludge was determined to be the appropriate remedy for this concern. However, the alum/YPS sludge lacked the essential nutrients to support vegetative growth. Following evaluation and testing, composted sewage sludge from Philadelphia and Camden was applied over the entire site to promote vegetation growth.

In August 1986, American Cyanamid was issued a New Jersey Pollutant Discharge Elimination System - Discharge to Ground Water (NJPDES-DGW) Permit NJ0061611 for discharge from the impoundments to the underlying aquifer. This permit resulted in a site assessment and several sampling events in the late 1980s by American Cyanamid consultants. Sampling events included sludge sampling, groundwater monitoring and surface water monitoring. Groundwater monitoring was performed using five shallow/deep monitoring well clusters. Surface water sampling included water in the impoundments and upstream and downstream sampling in the Rahway River and adjacent creeks. The preliminary assessment determined that approximately 100 pounds per day of cyanide was being discharged into the groundwater from the unlined impoundments. Cyanide was also detected outside the berms and in the Rahway River.

While performing the investigations, American Cyanamid challenged several conditions of the permit. The permit was determined to be invalid in April 1989, because the disposal site closed before January 1, 1982. As a result, the site was not subject to the requirements of the Solid Waste rules.

In August 1990, American Cyanamid and NJDEP Division of Hazardous Waste Management executed an Administrative Consent Order (ACO) to investigate and remediate potential contamination at the Warner Plant. On August 5, 1993, this ACO was amended to also require American Cyanamid to evaluate the potential for contamination from the six Carteret impoundments. In December 1993, the property ownership was transferred to Cytec.

Under the amended administrative consent order, a remedial investigation (RI) plan was prepared for Cytec. Although no additional soil or sludge samples were collected, three new monitoring well clusters, each containing shallow and deep wells, were installed and groundwater was sampled.

Remedial action consisted of a monitoring and maintenance program and a Declaration of Environmental Restrictions (DER). The DER was recorded May 4, 1995. The DER prohibited any alterations, improvements or disturbances of the site without prior written consent of NJDEP and required access control to prevent trespassing. The DER transferred with the property to subsequent owners or lessees.

Following remedial action workplan approval by NJDEP, three additional shallow/deep groundwater monitoring well clusters were installed on the site. Groundwater was monitored on the site for five years from 1995 through 1999. Sampling was performed semi-annually from 1995 through 1997 and annually in 1998 and 1999. Additional sampling for limited parameters was requested by NJDEP in 2000 and 2001 but was never performed. Trend analysis was performed on the five years of analysis results. In July and September 2002 Cytec petitioned NJDEP for a no further action determination for the site. On September 24, 2002, NJDEP issued no further action and covenant not to sue letters (NFA-CNS).

### 2.2.3 New Jersey Turnpike Authority

In 2005 the New Jersey Turnpike Authority (NJTA) investigated a portion of the site as a possible route for the Tremley Point Connector Project. NJDEP authorized the NJTA to take limited geotechnical borings in the wetlands and open water of the Rahway River. Included within the NJDEP authorization was an authorization by the Bureau of Operations, Maintenance and Monitoring to drill borings within the area covered by the DER on the Cytec property. NJDEP Land Use Regulation Program provided the following guidance on conducting these borings "...based upon best professional judgment, it's determined not (Cytec lagoon) to be wetlands since the DEP has not made a decision and has not requested additional information." The geotechnical boring program was completed in early 2006.

Three environmental borings were drilled in the area of Impoundment 3. Samples collected from these borings were analyzed for the target compound list plus cyanide and petroleum hydrocarbons. Laboratory results from an NJDEP-licensed laboratory were compared to residential and non-residential direct contact soil cleanup criteria (RDCSCC and NRCSCC) for soils.

PAH compounds were detected in all three samples from Impoundment 3, along with metals, petroleum hydrocarbons and cyanide. Phthalate plasticizers were found in two of the samples. PAH concentrations exceeded the current non-residential remediation standards in two of the samples. The highest measured concentration of benzo(a)pyrene was 1,700 ug/kg in sample E-3.

Water samples were also collected from surface water in Impoundment 3 and the adjacent Rahway River. These samples were analyzed for the target compound list plus cyanide and petroleum hydrocarbons. The results were compared to the NJDEP Surface Water Quality Standards (SWQS).

The analytical results from the surface water samples from Impoundment 3 had a concentration above the SWQS for a phthalate plasticizer. A sample collected on the site near the impoundments had concentrations of base neutrals, a pesticide and heavy metals that exceeded the SWQS. A second surface water sample collected near the impoundments had concentrations of heavy metals in excess of the SWQS.

A site inspection performed by a Cytec consultant in February 2006 identified that the field work had caused some damage to the berms between the impoundments and the river. This damage was causing runoff to pond on the berms and overtopping of the berm at high tide. Repairs were performed prior to the biennial report issued in December 2006. Additional

information on this and other berm damage, repair and maintenance activities is provided in Section 4 of this PA.

### 2.2.4 2006 Preliminary Assessment

A Preliminary Assessment (PA) was performed on the site in October 2006 by SESI Consulting Engineers for Titan PDC Carteret II, LLC. The PA identified nine areas of concern (AOCs):

- AOC #1 Residue Sludge Chemical Constituents: In addition to the alum-YPS components, the sludge may contain other chemical constituents including sulfuric acid, acrylamide, polyacrylamide, methyl-bis-acrylamide, dimethyl phosphorochlorodithionate, surfactants, water/wastewater treatment chemicals, mining/ore production chemicals, organo-phospate pesticides, sodium hydrosulfide, disposal of phosphate waste associated with the incinerator scrubber, phosphorus pentasulfide, cyclohexane, naphthalene solvent and isobutyl alcohol. Analysis of a representative number of sludge samples for NJDEP soil clean-up criteria parameters was recommended. Additionally, hazardous waste characteristics tests were recommended.
- AOC #2 Residue Sludge Extent: The residue sludge is mostly contained within the soil berms. However, a review of historical boring logs in the vicinity of the berms indicates that a layer of sludge exists beneath the berms in some locations. In addition, historical correspondence indicates that in some areas, sludge likely extends beyond the present location of the berms resulting from two incidents of embankment failure along the northern and southern parts of Impoundments 4 and 5. The extent of the residue sludge beyond the impoundment berms should be further investigated.
- AOC # 3 Residue Sludge and Containment Berm Stability: The structural engineering properties of the residue sludge are very poor. The sludge within the impoundments is not capable of supporting structures, or possibly even lightly loaded construction equipment. Stabilization and/or solidification of the residue sludge will represent a very significant cost addition to any proposed site redevelopment plan. In addition, the structural stability of the berms should be evaluated and the berm containment system stabilized if necessary. There have been instances of failures in the past.
- AOC # 4 Impacts to Surface Water Quality: The portion of the Rahway River that abuts the former American Cyanamid property is classified as SE3 (saline estuarine). A review of the limited surface water quality data indicates that cyanide and manganese were detected at concentrations that exceed the applicable most stringent surface water quality standard (SWQS). Specifically, cyanide was detected at concentrations that ranged between 7.9 to 201 ug/L, exceeding the applicable SWQS that is protective of aquatic life of 1 ug/L. Manganese was also detected at concentrations that ranged between 33.9 to 189 ug/L, exceeding the applicable SWQS of 100 ug/L. Cyanide is a site-specific contaminant associated with the sludge and it is possible the cyanide could be mobilized by storm water runoff and/or by discharge of shallow groundwater. The relatively high levels of manganese in the surface water are likely associated with the high levels of manganese characteristic of the regional groundwater that is discharging from the site.

A six inch transite pipe used to discharge sludge onto the site from the former American Cyanamid plant runs across the Rahway River. This pipe, if it was not removed or properly abandoned, may act as preferential pathway for migration of potential contaminants into the Rahway River. Also, NJDEP reported the existence of Outfall No. 7, a suspected storm water outfall for discharging supernatant from the impoundments. Additional investigation to further evaluate impacts to the Rahway River is recommended.

- AOC # 5 Fill Used to Construct Access Roads: Fill generated during the demolition of structures at the Warner Plant in Linden was reportedly used to construct and maintain the access roads around the embankments. This fill may be potentially impacted by historical operations associated with these structures. Limited sampling and analyses could be performed of the roadbed materials to determine if the material is impacted.
- and MW-1D contains slightly elevated levels of volatile organic compounds (VOCs), which exceed the applicable NJDEP Generic Vapor Intrusion Screening Levels for groundwater. These impacts were suspected to be associated with operations of Industrial Reclamation Service, an operator associated with the neighboring property. The proposed redevelopment is situated near groundwater monitoring wells MW-1S and MW-1D. The extent of the elevated levels of VOCs is not currently known. Delineation of the extent of the elevated VOCs may need to be performed in accordance with the NJDEP Vapor Intrusion Guidance Document.
- AOC # 7 Ecological Evaluation: The discharge of impacted groundwater into the surface water bodies in the vicinity of the Site is possibly impacting the local ecology. No ecological studies, with the exception of delineation of the extent of wetlands, have been completed, based on our reviews. Further investigations should be implemented; as described for AOC # 4.
- AOC # 8 Solid Waste: A pile of railroad ties that were reportedly utilized to construct the access roads remains at the site. No further investigation to evaluate potential impacts from these railroad ties is recommended, as the area of the ties is small and the potential for environmental impact is negligible relative to the other issues throughout the site.
- AOC # 9 Natural Resource Damages: SESI has not evaluated the potential for NJDEP assessing Natural Resource Damages as a part of this PA report.

The LSRP has reviewed this PA and the list of AOCs. This AOC list will be utilized as the starting point in evaluation of AOCs for this current PA.

The PA also indicated that the approved engineering and administrative controls did not appear to still be protective of public health and safety and that some or all of the factors and assumptions used as the basis for the site specific remediation might not still be valid.

### 2.3 Current Site Conditions

At the present time, the site consists of the six sludge impoundments surrounded by the containment berms. Several pathways have been built through the impoundments to allow

access for maintenance or access to the eight existing monitoring well clusters. The berm between Impoundments 4 and 5 was not visible, merging these two impoundments into a single larger impoundment.

In its current condition, the project site is unusable. Most of Impoundment 6 is filled with standing water. Vegetative cover is non-existent over most of the area of the remaining impoundments, with the exception of Impoundment 1 and the low areas of Impoundment 3. The 12 inch cover of soil and sewage sludge has been eroded away in most other locations on the impoundments leaving exposed alum-YPS sludge. Phragmites have grown in the soil on the berms and the roadways surrounding the impoundments.

These impoundments are impassable because the sludge has no strength and cannot bear any weight. A pole or rod can be pushed by hand its full length into the sludge with minimal effort.

Impoundment 3 is the lowest area on the site and appears to have been inundated regularly by the Rahway River. Trash and debris consistent with river water flowing onto the impoundment were visible.

Impoundment 2 has been covered with several feet of soil (undocumented fill) and was used for a wood waste recycling operation. That operation was halted in 2008, although wood waste from the operation remains on-site. A portion of the soil surface is covered with wood chips and there are several piles of wood chips remaining on the site.

Photographs of the existing site conditions are contained in Appendix C.

### 3. HISTORICAL RESEARCH

### 3.1 Sanborn Fire Insurance Maps

EastStar contracted with EDR Incorporated to search for historic Sanborn fire insurance maps of the site. No maps covering the site were identified in the search. The search included Sanborn collections from Library of Congress, University Publications of America and a private collection owned by EDR. The Sanborn Map search report is contained in Appendix D.

### 3.2 Title and Deed Search

The site is currently owned by Rahway Arch Properties, LLC. Rahway Arch purchased the site on January 15, 2010 from Carteret Development LLC. The deed was recorded on January 19, 2010 in Liber 6127, Folio 864 of the Middlesex County land records.

The deed states that the conveyance of the property is subject to several existing activity and use limitations (AULs) including:

- Administrative Consent Order (ACO) dated September 5, 1990 and the Amended Administrative Consent Order dated July 6, 1993 between NJDEP and American Cyanamid Company
- Declaration of Environmental Restrictions (DER) dated April 26, 1995
- No Further Action Letter (NFA) and Covenant Not to Sue by NJDEP dated September 24, 2002
- Several access and easement agreements

The current deed is contained in Appendix B. Refer to Schedule B of the deed for the list of easements, covenants, restrictions and other encumbrances.

Carteret Development LLC obtained title to the site in 1999 from Cytec. A chain of title search was performed as part of the 2006 PA. This chain of title search shows that the parcels were first obtained by American Cyanamid in the 1930s. The properties were transferred to Cytec in 1993 and then from Cytec to Carteret Development LLC in 1999.

### 3.3 Historical Aerial Photographs

Eight historical aerial photographs of the site were reviewed. The earliest photograph was taken in 1943. The most recent photograph was taken in in 1995. The appearance of the site in each of the photographs is described in the following paragraphs. Copies of the photographs are contained in Appendix E.

### 3.3.1 1943 Aerial Photograph

The scale of this photograph is 1'' = 750'. The berms that form Impoundments 1 and 2 are clearly visible in the photograph and appear to contain sludge. The berms for Impoundments 3 and 4 are under construction, with Impoundment 3 almost complete and only a small portion of

the berm for Impoundment 4 complete. The remainder of the site is undeveloped. Tidal creeks and drainage coursed drain the site north, east and west to the Rahway River. No buildings or structures are located on the site other than the berms.

The area west of the Site is undeveloped. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.2 1954 Aerial Photograph

The scale of this photograph is 1" = 750'. Impoundments 1, 2, 3, 4 and 5 can be seen and are complete. Sludge appears to have been placed in Impoundments 1, 2 and 3. Impoundments 4 and 5 appear to be in use. The remainder of the site is undeveloped. Tidal creeks and drainage courses drain the future area of Impoundment 6 northwest to the Rahway River. No buildings or structures are located on the site other than the berms. The site access road can be seen in the photo, along with an internal road on the berms connecting the impoundments.

The area west of the Site is undeveloped. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.3 1963 Aerial Photograph

The scale of this photograph is 1" = 750'. Impoundments 1, 2, 3, 4 and 5 can be seen and are complete. Sludge appears to have previously been placed in Impoundments 1, 2 and 3, but they appear to be inactive at the time this photograph was taken. Impoundments 4 and 5 also contain sludge and appear to be in current use for sludge disposal. Berms for Impoundment 6 appear to be under construction. The remainder of the site is undeveloped and appears the same as on the 1954 photograph. No buildings or structures are located on the site other than the berms.

Most of the area west of the Site is undeveloped. A small land disturbance can be seen west of Impoundment 3.A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.4 1966 Aerial Photograph

The scale of this photograph is 1" = 750'. Impoundments 1, 2, 3, 4 and 5 can be seen and are complete. Sludge appears to have been placed in Impoundments 1, 2 and 3. Impoundments 4 and 5 appear to be in use. Berms for Impoundment 6 are complete, but the impoundment does not appear to be in use. The remainder of the site is undeveloped and appears the same as on the 1963 photograph. No buildings or structures are located on the site other than the berms.

The area west of the site appears to be a landfill. An additional small land disturbance can be seen west of Impoundment 3. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.5 1970 Aerial Photograph

The scale of this photograph is 1'' = 750'. All of the impoundments can be seen and are complete. Sludge appears to have been placed in all of the impoundments as can be seen by small surface drainage patterns. Impoundment 6 appears to be in use with water accumulated

on the north side of the impoundment. The remainder of the site is undeveloped and appears the same as on the 1966 photograph. No buildings or structures are located on the site other than the berms.

The area west of the site appears to be a landfill. The small land disturbance can also be seen west of Impoundment 3. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.6 1978 Aerial Photograph

The scale of this photograph is 1'' = 750'. All of the impoundments can be seen and are complete. Sludge appears to have been placed in all of the impoundments. Vegetation appears to have gown on Impoundment 1 and the east side of Impoundment 2. A narrow area of water is located on the west side of Impoundment 6. The remainder of the site is undeveloped and appears the same as on the 1970 photograph. No buildings or structures are located on the site other than the berms.

The area west of the site appears to be a landfill. The small land disturbance can also be seen west of Impoundment 3. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.7 <u>1984 Aerial Photograph</u>

The scale of this photograph is 1'' = 1,000'. Nothing appears different regarding the site on this photograph compared to the 1978 photograph. No buildings or structures are located on the site other than the berms.

The area west of the site appears to be a landfill. The small land disturbance can also be seen west of Impoundment 3. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.3.8 <u>1995 Aerial Photograph</u>

The scale of this photograph is 1" = 833'. Impoundments 1, 4 and 5 appear to be vegetation, along with the east side of Impoundment 2 and a small area on the south side of Impoundment 3. The berm separating Impoundments 4 and 5 appears to have been improved. Impoundment 6 appears to have been subdivided with several berms. No buildings or structures are located on the site other than the berms.

The area landfill west of the site appears to be covered. The small land disturbance can also be seen west of Impoundment 3. A tank farm is located to the south and east. Industrial properties are located across the Rahway River.

### 3.4 Historical USGS Topographic Maps

Seven historical USGS topographic maps of the site were reviewed. The earliest map was drawn in 1891. The most recent map was drawn in 1981. The appearance of the site in each of the maps is described in the following paragraphs. Copies of the maps are contained in Appendix F.

### 3.4.1 <u>1891 Staten Island 15 Minute Series Map</u>

This map is drawn at a 1:62,500 scale. The entire site and all of the surrounding properties are shown as wetlands. Several creeks extend from the site to the Rahway River. No buildings or structures are shown on the site.

### 3.4.2 1900 Staten Island 15 Minute Series Map

This map is drawn at a 1:62,500 scale. The entire site and all of the surrounding properties are shown as wetlands. Several creeks extend from the site to the Rahway River. No buildings or structures are shown on the site.

### 3.4.3 1900 Passaic 30 Minute Series Map

This map is drawn at a 1:125,000 scale. The entire site and all of the surrounding properties are shown as wetlands. No buildings or structures are shown on the site.

### 3.4.4 <u>1905 Passaic 30 Minute Series Map</u>

This map is drawn at a 1:125,000 scale. The entire site and all of the surrounding properties are shown as wetlands. No buildings or structures are shown on the site.

### 3.4.5 <u>1947 Arthur Kill 7.5 Minute Series Map</u>

This map is drawn at a 1:25,000 scale. The entire site and most of the surrounding properties are shown as wetlands. Several creeks extend from the site to the Rahway River. No buildings or structures are shown on the site.

A tank farm, identified as Mexican Petroleum Company, is located south and east of the site. The American Cyanamid Company plant is shown and identified across the Rahway River, east of the site on Tremley Point.

### 3.4.6 1966 Arthur Kill 7.5 Minute Series Map

This map is drawn at a 1:24,000 scale. Impoundments 1, 2, 3, 4 and 5 are shown on the site, along with a berm that is the start of Impoundment 6. A road extends from Industrial Road onto the site, ending just short of Impoundment 5. The area east of Impoundment 3 is shown as wetlands. Most of the creeks and drainage areas previously seen on the site appear to have been filled. An additional impoundment is shown on Block 9.03, Lot 21, east of Deep Creek from Impoundment 2. No evidence was identified in the historical data that this potential impoundment was ever used to contain sludge. No buildings or structures are shown on the site.

A tank farm is located south and east of the site. Tank farms and industrial properties are shown and identified across the Rahway River, east of the site on Tremley Point. No development is shown on the landfill are to the west of the site.

### 3.4.7 <u>1981 Arthur Kill 7.5 Minute Series Map</u>

This map is drawn at a 1:24,000 scale and is a photo-revision of the 1966 map. The site appears exactly the same on this map as it does on the 1966 map. No buildings or structures are shown on the site.

A tank farm is located south and east of the site, with tanks immediately south of Impoundment 1. Tank farms and industrial properties are shown and identified across the Rahway River, east of the site on Tremley Point. The landfill is to the west of the site.

### 4. SITE CONDITIONS

### 4.1 Geology

### 4.1.1 Site Geology

The project site is located along the boundary of the New Jersey Piedmont and Coastal Plain Physiographic Provinces. The surface deposits in the area consist of approximately 20 to 40 feet of Quaternary alluvium, composed of interbedded silt, sand, gravel and clay of glacial origin, with buried peat and organic horizons. Underlying the Quaternary alluvium are the bedded shales, mudstones and sandstones of the Triassic-age Brunswick Formation.

The unconsolidated overburden materials along this physiographic boundary were deposited in a brackish estuarine, salt-marsh environment. The site and the surrounding properties are located on a former tidal marsh. The soils of the marsh are mostly silts and clays containing an upper horizon of grey, organic silt interspersed with decomposed roots and grasses, locally referred to as the "meadow mat." During installation of the initial ten monitoring wells, Hydrosystems encountered between 10 and 25 feet of this marsh deposit, mostly consisting of black organic sandy silt (peat). Permeability tests on the peat indicated that it has a highly variable permeability, varying in the  $10^{-3}$  to  $10^{-6}$  cm/s range.

Underlying overburden is a dense, hard, red siltstone of the Brunswick Formation. This weathered bedrock surface ranges from depths between 29 and 42 feet below ground surface.

### 4.1.2 General Configuration of Impoundments

At least four subsurface investigations were performed at the site from 1981 to 1997. Refer to the list of historic documents contained in Appendix A for the available documents regarding the historical geotechnical data and the known historical borings, wells, soil logs and test areas on the site. Cross-sections of the impoundments, prepared by Cytec consultant Blasland, Bouck and Lee (BBL) in 2002 are contained in Appendix G. In summary the site subsurface conditions, from the top down, consist of:

- □ Alum/YPS sludge with limited undocumented soil cover in the impounds and undocumented fill soil on the berms.
- Native, alluvial, soft, peat (meadow mat) and organic clay
- Native, alluvial and glacial, clay, silt, sand, and gravel soils
- Weathered siltstone/shale bedrock.
- Hard siltstone/shale bedrock.

### 4.1.3 <u>Impoundments</u>

The alum and YPS sludge contained within the six site impoundments is very soft, saturated and compressible with negligible shear strength. Tests performed on this sludge indicate that it has low to no plasticity, and that it is highly sensitive. In 1999, BBL, as consultant to Cytec

stated: "While the material may initially appear to be firm, disturbance will cause the material to behave like a highly viscous liquid".

Based upon data accompanying the NFA&CNS, the sizes, ages and thicknesses of the sludge vary for each impoundment as shown in Table 4.1.

**Sludge Thickness Impoundment** Year Established Size (acres) (feet) Impoundment 1 1933 12 7 to 8 1938 Impoundment 2 18 5 to 7 Impoundment 3 1938 15 6 to 10 Impoundment 4 1948 13 to 21 10 Impoundment 5 1953 15 6 to 19 Impoundment 6 1963 20 15 to 18

Table 4.1 - Impoundment Information

Data from some of the soil borings contained in the historical documents identified some sludge under the containment berms. The analyses contained in these reports also indicate that some sludge exists outside of the containment berms likely from localized berm failures that have occurred over the years.

Testing of 12 sludge samples from near the surface of the impoundments by M. Disko Associates on 1981 measured a permeability of lx10-4 to 8x10-6 centimeters per second. This low permeability is creating the bathtub like effects currently observed in the impoundments. Stormwater is trapped in the impoundments by the low permeability sludge forcing it to slowly percolate through the sludge. This water dissolves cyanide and metals from the sludge transporting them to the underlying groundwater.

The berms consist of undocumented soil fill that was placed to form the impoundments. The depth of the berms is not known, although BBL reported in 1999 that the berms may have been constructed directly on the peat layer. Additional investigations indicate that the berms do not contain clay cutoff walls. Some of the boring logs indicate that a layer of sludge was encountered beneath the berms. The structural stability of the berms has not been evaluated.

### 4.1.4 Natural Materials

Beneath the sludge and berms is a soft, compressible stratum of native peat (meadow mat). This is a recent deposit of decomposed vegetation mixed with organic clay and silt, deposited by the Rahway River. Beneath the peat, is a stratum of soft organic clay, which is also a recent river deposit. This stratum is thickest towards the Rahway River, and decreases in thickness away from the river. Some of the borings indicate that the combined thickness of these strata approach 20 feet near the river.

Native soils are located beneath the peat and organic clays. These native soils consist of a mixture of alluvial and glacial clay, silt, sand and gravel. Bedrock was encountered at depths typically between 30 and 40 feet below grade. The bedrock is red-brown siltstone/shale and has a weathered surface layer.

### 4.2 <u>Hydrogeology</u>

### 4.2.1 <u>Monitoring Wells</u>

Five monitoring well pairs were installed at the site in the mid-1980s for NJPDES - DGW Permit No. NJ0061611. The wells were installed to monitor the groundwater quality within the two groundwater zones. The shallow monitoring wells ranged from 15 to 31 feet deep. The deep monitoring wells ranged from 38 to 54 feet deep. These wells were sampled quarterly until American Cyanamid was notified in February 1990 that the NPDES permit was invalid.

Three additional monitoring well pairs were installed on the site in 1994 as described in the approved remedial action workplan. These wells had approximately the same depths as the original five well pairs. The monitoring well locations are shown on Figure 4.1.

All eight monitoring well pairs were sampled from 1995 through 1999 as part of the remedial action. Semi-annual sampling was performed in 1995 through 1997 and annual sampling was performed in 1998 and 1999. The results of the remedial action sampling are summarized in the 1999 groundwater sampling report prepared by BBL.

### 4.2.2 Aquifer Characteristics

The general site hydrostratigraphy is described in detail in reports by BBL and Hydrosystems. Groundwater is contained within two distinct aquifers:

- An unconfined shallow aquifer of permeable fill materials and tidal marsh deposits
- The confined Brunswick Formation shallow bedrock aquifer

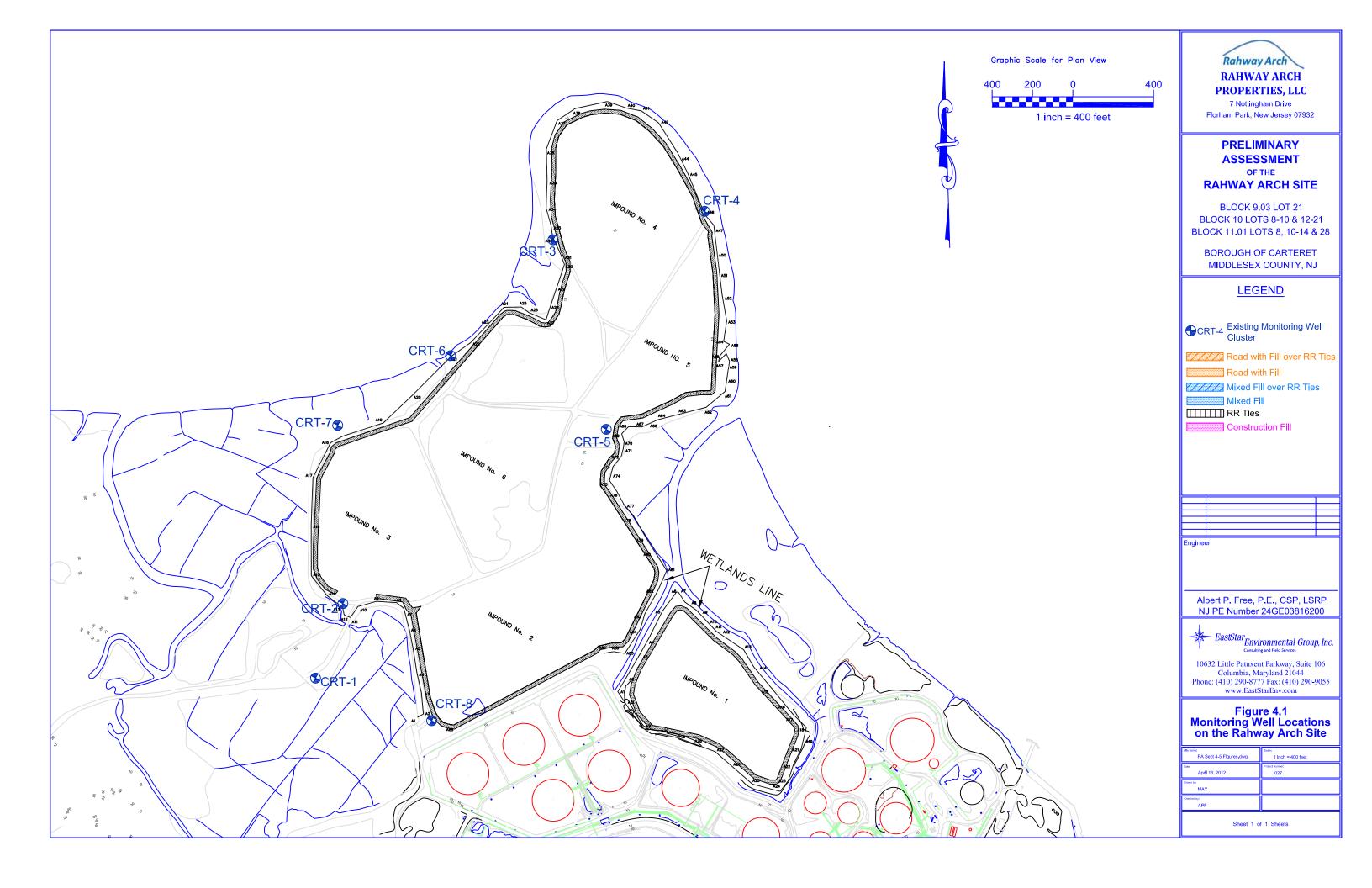
A continuous layer of red-brown clay separates these two aquifers and acts as a confining layer for the underlying Brunswick Formation. This clay layer restricts the vertical flow of water between the shallow and bedrock aquifers.

The shallow groundwater aquifer is brackish and tidally influenced. As a result, the groundwater was classified as IIIB and alternative Class IIIB groundwater quality criteria were developed for the site as part of the remedial action.

### 4.2.3 Groundwater Flow

Shallow groundwater is reportedly mounded beneath the impoundments and flows radially outward from the central area of the impoundments and discharges into surrounding surface water. Deep groundwater flow is generally to the north or northeast where it also discharges to the surrounding surface water (the Rahway River and the Arthur Kill). The groundwater flow direction and mounding maps from the 1987 Hydrosystems report are contained in Figures 4.2 and 4.3.

The remedial action report indicated that groundwater-to-surface-water discharge could be inferred from existing ground-water elevation data, but found the relationship is difficult to quantify because there were no contemporaneous surface water elevation data for the Rahway River, Cross Creek and Deep Creek to match the monitoring well data. The groundwater to



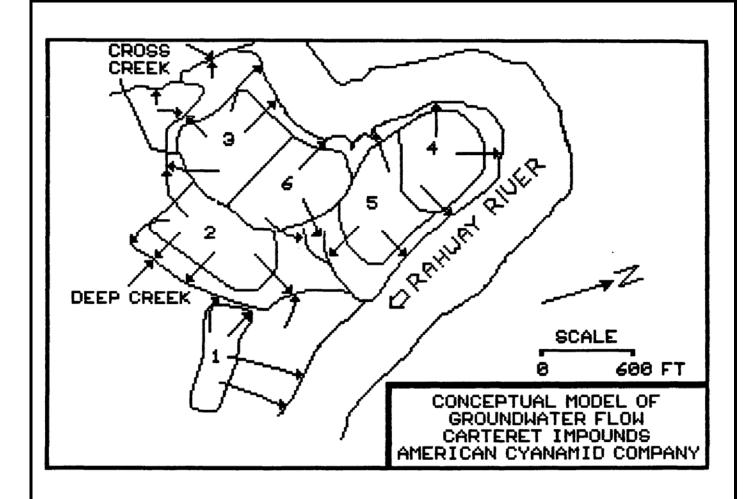


Figure 6. Areal map of the Carteret Impounds showing the conceptual model of groundwater flow radially outward from the watertable mound within the impounds. Groundwater originating within the impounds discharges into the surrounding surface water.

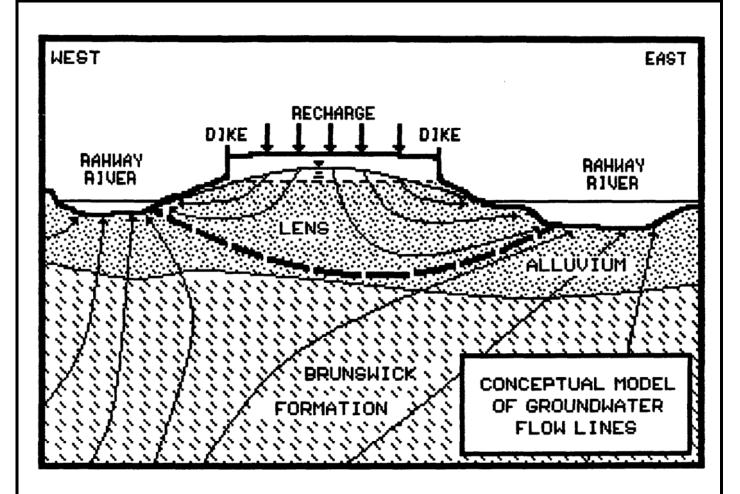


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### FIGURE 4.2

Conceptual Model of Groundwater Flow Directions by Hydrosystems, Inc. 1987

Scale:	AS SHOWN	Date: April 2012
Drawn By:	JAC	Checked By: APF



Generalized West-to-East cross-section through the Carteret Figure 5. Impounds showing the conceptual model of the groundwater flow Groundwater moves upward out of the Brunswick system. Formation to discharge into the surface water. Groundwater mounded within the impounds moves radially outward discharge into the surrounding surface water. The density contrast between the impound leachate and native groundwater and the upward gradient in the Brunswick Formation should limit the extent of groundwater movement out of the impounds to a lens-shaped zone defined by the area above the thick dashed line.



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### FIGURE 4.3

Conceptual Model of Groundwater Mounding and Flow by Hydrosystems, Inc. 1987

Scale:	AS SHOWN	Date: April 2012
Drawn By:	JAC	Checked By: APF

surface water discharge relationship for the southeast portion of the site was unknown because monitoring wells could not be installed along the Rahway River shoreline in this area. Data on the type and orientation of fractures in the bedrock aquifer system was also limited, as was knowledge of general locations of fracture discharge zones.

Based upon the available data and flow patterns, groundwater originating as infiltration through the impoundments moves radially outward from the impoundments, ultimately discharging to the adjacent surface waters of the Rahway River, Cross Creek and Deep Creek. In 1989 Hydrosystems indicated that the water table was approximately 2 feet below ground surface (bgs) in the shallow monitoring wells, roughly 5 to 10 feet above mean sea level. Water table mounding occurs in the shallow aquifer beneath the impoundments. The mounded ground water directly under the impoundments apparently is further isolated from the more saline regional ground water by a difference in density.

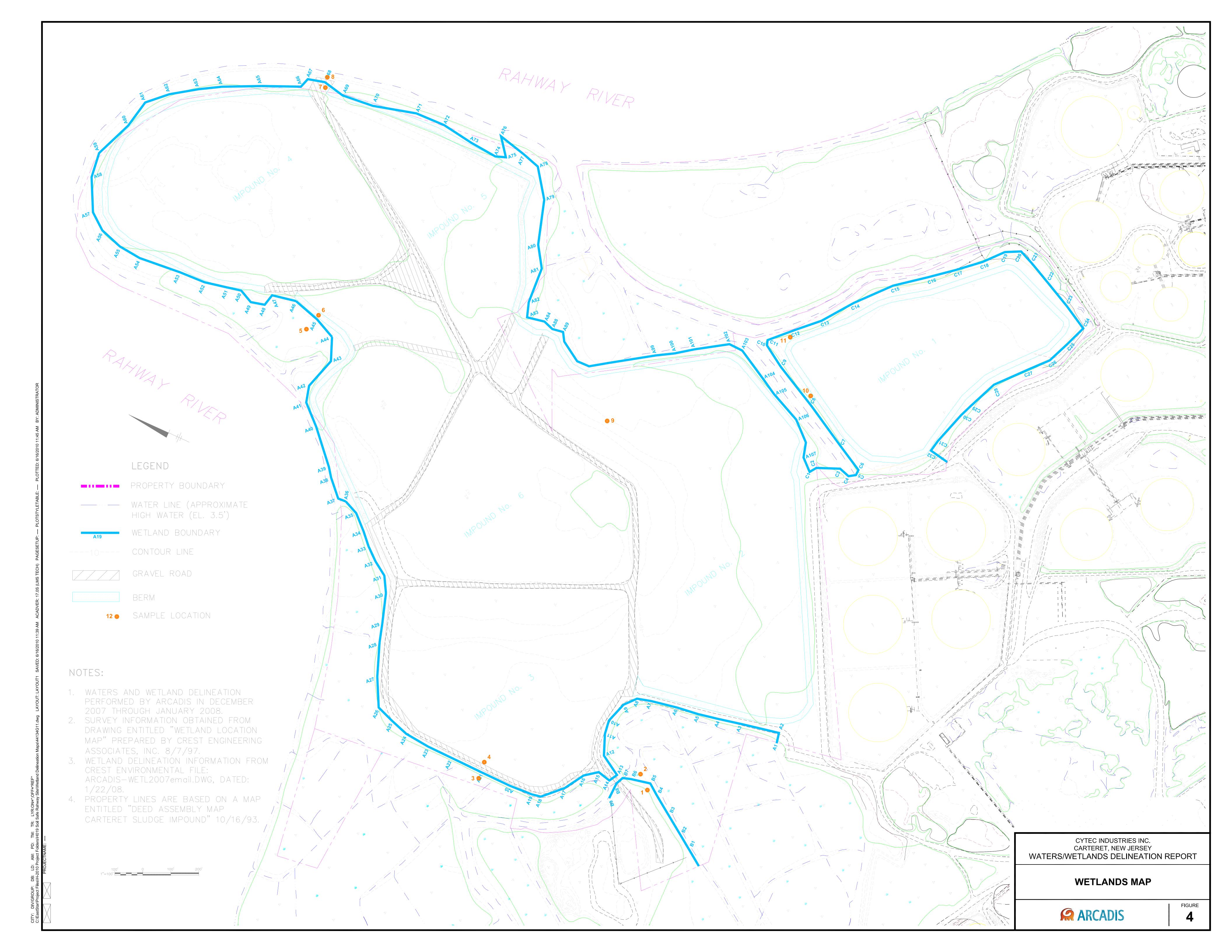
The Brunswick Formation typically has a low primary porosity because the rock is generally fine-grained. Where coarser-grained rock is present, it is tightly cemented and has a high clay mineral content. Most of the groundwater storage and movement in the Brunswick Formation occurs either in bedding plane fractures or in secondary fractures (joint sets) formed by stress related to faulting following the deposition and lithification of the beds (USGS, 1968). Regional flow in the Brunswick Formation occurs vertically and laterally toward the northeast, with ultimate discharge to surface water bodies which, in the vicinity of the Carteret Impoundments, include the lower Rahway River, Arthur Kill, and, eventually, the Atlantic Ocean.

Hydrosystems in 1989 estimated the discharge to groundwater from the site ranged between approximately 11,000 cubic feet per day (cfd) [82,000 gallons per day (gpd)] and 17,000 cfd (130,000 gpd). In 2012, EastStar estimated recharge through the impoundments at 9,340 cfd (69,800 gpd). These estimates are hydrologic budget calculations using regional rainfall data and site-specific conditions. The EastStar hydrologic budget calculations are provided in Appendix H.

### 4.3 Wetlands

Wetland areas cover approximately 35 acres of the 124.7-acre site. Wetlands were delineated in July 1997, and a Freshwater Wetlands Letter of Interpretation (LOI) (File No. 1201-97-0004.1) was issued by NJDEP Land Use Regulation Program (LURP) on March 13, 1998. Freshwater Wetland LOI extension packages were submitted in February 2003 and May 2008 to NJDEP LURP to extend the LOI. Both extensions were approved, and the current LOI is valid through September 22, 2013. The site plan from the LOI showing the wetlands is shown in Figure 4.4.

Wetlands onsite consist of tidal saltmarsh wetlands and high-marsh wetland ecotonal edges. Wetland areas exist on the edges of impoundment areas and continue to the Rahway River. New Jersey Administrative Code 7:9B classifies the Rahway River near the site as SE3, a saline estuarine water body. Hydrology of site wetlands is dominated by fluctuating tidal levels of the Rahway River. Wetland soils onsite consist of Psamments (somewhat poorly drained sandy fill material) and Sulfaquents/Sulfihemists (very poorly drained organic and mineral soils subject to tidal flooding).



Wetland vegetation in saltmarsh areas is dominated by the herbaceous species Spartina patens (saltmeadow cordgrass), Phragmites australis (common reed), and Juncus gerardii (saltmeadow rush). Trees and shrubs, such as Ailanthus altissima (Chinese tree-of-heaven), Prunus serotina (wild black cherry), Bacharis halmifolia (Eastern false-willow), and Iva frutescens (big-leaf sumpweed), are the dominant vegetation in the high-marsh ecotonal edge wetlands.

There is no indication of any intentional placement of alum-YPS sludge outside the impoundments or in the wetland areas. However, berm overtopping and berm failure events have been documented.

### 4.4 Containment Berms

The containment berms have been part of several previous investigations performed since the late 1970s. Based upon available information, the berms appear to have been constructed directly on meadow mat, existing ground surface at the times the berms were built. There is no evidence that the berms were keyed into the existing ground surface or more competent material. The berms appear to have been constructed with available materials. No evidence of a clay core that would prevent seepage through the berms was documented in any of the investigations.

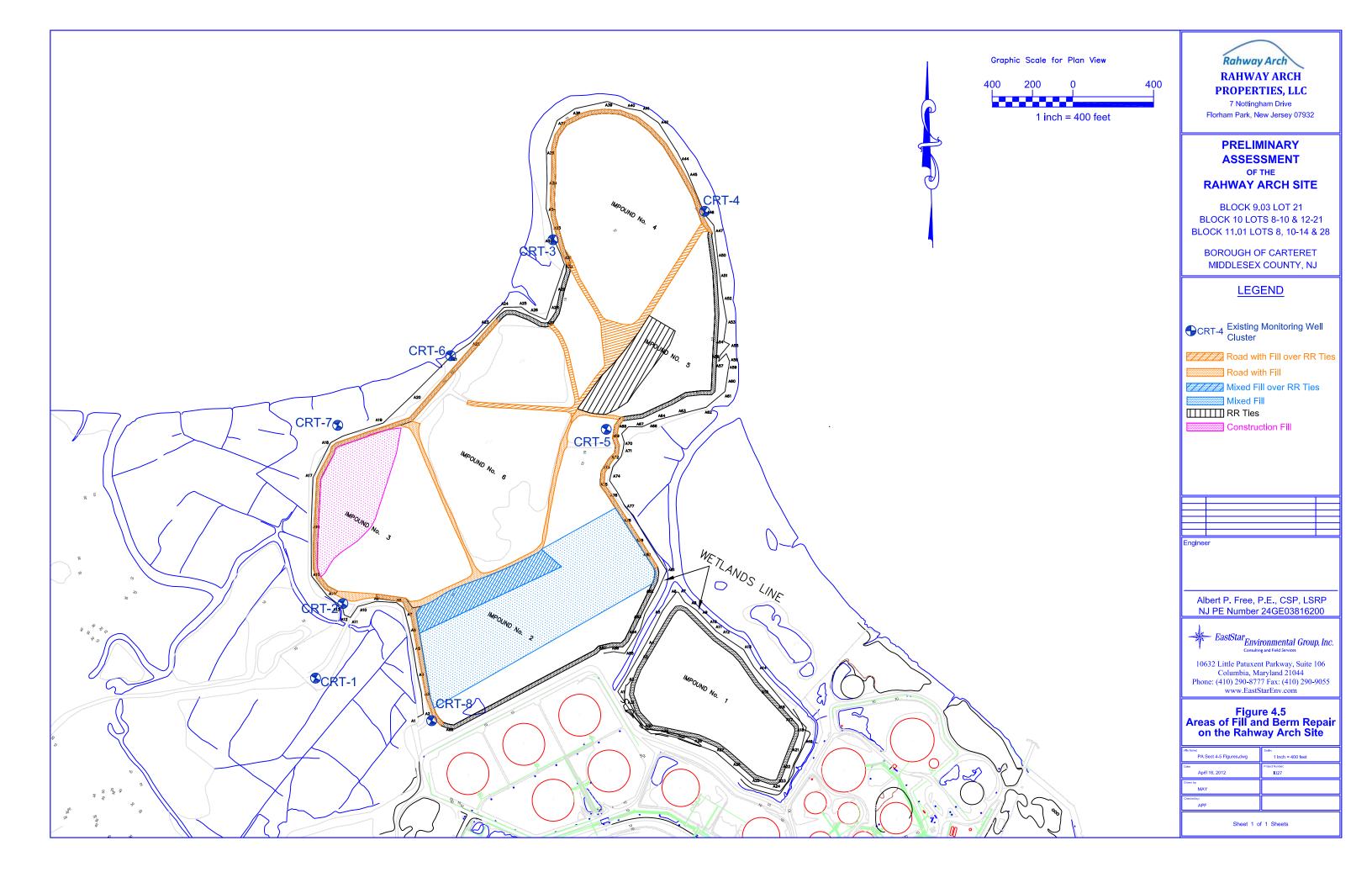
Review of the documentation identified that the berms are not effective in containing contaminated leachate within the impoundments and the multiple berm failures have occurred, resulting in direct releases of the sludge to the Rahway River and the adjacent creeks. Stabilization and continued maintenance will be necessary to prevent future failures and discharges.

Summaries of the various berm investigations, maintenance and repairs identified in the historic reports are provided in the following sections. Repaired areas of the berms and filled areas of the site, developed as part of the 2011 investigation are shown in Figure 4.5.

### 4.4.1 Preliminary Study of Revegetation of Sludge Impounds

In November 1979, Dames & Moore began an investigation to grow a vegetative cover on the impoundments to prevent releases of windblown dust. The initial investigation included an assessment of the berms for Impoundments 2, 3, 4, 5 and 6. The report documented berm failures and releases of sludge that had occurred as a result of the berm failure and operation of the impoundment site, including:

- Dikes along the south and east borders of Impoundment 2 were missing and much of the impoundment was experiencing tidal inundation, eroding the sludge and depositing it along the stream east of the impoundment.
- □ The northern and western fringes of Impoundment 3 were within the tidal influence of the river, resulting in wash of sludge materials to the west into the river.
- □ Impoundments 4 and 5 were originally constructed with timber dikes along the river to allow the supernatant to drain from the impoundments. To stop the outward movement of these dikes towards the river, they were reinforced with soil and additional timber.



- □ The dike at the southern end of Impound 5 had given way, discharging sludge into the marsh south of the impoundment. The dike was repaired by dumping soil (undocumented fill) from trucks.
- □ The wooden dike on the north site of Impoundment 4 had failed, washing sludge into the river.
- □ Sludge had been excavated from Impoundment 6 and placed in Impoundments 2 and 3 and on the outside of the dike along Impoundment 6, adjacent to the Rahway River.

### 4.4.2 <u>Test Borings and Dike Evaluation</u>

In 1981, M. Disko Associates evaluated the dikes by drilling test borings and performing permeability tests. The results confirmed that the dikes had been built directly on the meadow mat and that they did not contain impervious clay cores or clay cut-off walls. In fact, the permeability tests showed that the dike material was more permeably than the sludge. The report concluded that the dikes were ineffective in the prevention of lateral movement of water out of the impoundments.

The dikes were comprised of fill ranging from sand to a mixture of sand, slit and clay. This fill was not properly compacted when it was placed. Sludge was identified under the dikes in 7 of the 11 borings. The source of the sludge under the dikes was not known, but the report speculated that the disposal area might be larger than the footprint outlined by the dikes.

The report recommended capping the tops and sides of the impoundments with a low permeability clay to prevent water from entering the impoundments and reduce the long-term potential for leachate contamination of the surface and groundwater.

### 4.4.3 Maintenance During Remedial Action

From 1995 through 1999, groundwater and surface water samples were collected at the site by BBL. While on-site, BBL inspected the berms and recommended maintenance activities. Maintenance, when required, was performed by Cytec.

According to the 1999 summary report on the remedial action, Cytec performed maintenance on the berms in October 1995, consisting of:

- Re-grading the drainage swale on the south side of Impoundment 2 to achieve proper gravity flow of surface runoff.
- Restoration of rip-rap along the south and west slopes of Impoundment 3
- Reshaping and re-stoning roadways at Impoundments 4 and 5
- Extension of roadways to monitoring well clusters CRT-5 and CRT-7

Maintenance work was also performed on the existing dirt access roadway consisting of shaping and leveling the roadway, construction of a new roadway from the South Culvert to the North Culvert and repairing timber curb edges of the south roadway culvert.

In July 1998, BBL applied to NJDEP LURP for approval to repair winter erosion damage along the Impoundment 1 berms that were located within the mapped wetlands. No documentation was found to determine if this work was ever performed.

### 4.4.4 Maintenance After Remedial Action

Following issuance of the NFA in September 2002, the condition of the berms was monitored every six months as part of the biennial certification requirements. Specific details regarding the berm failures and maintenance activities were not provided in the biennial reports, although the following repairs were documented:

- □ In October 2003, Cytec applied for a Waterfront Development/Coastal Wetlands permit to repair damage to the berm between Impoundment 4 and the Rahway River. According to the application, repairs were required along the entire length of the berm adjacent to the river. The work was needed to repair a breach in the dike and to provide an access way for future repair and maintenance.
- Berm repairs were performed around parts of Impoundments 5 and 6 in 2004 and 2005. These repairs consisted of adding fill material along the outsides of the berms. This work was performed under a waterfront development permit issued by NJDEP-LURP. Replacement of the bridge that access the site and repairs to the culverts adjacent to the bridge were also included in this work.
- □ In February 2006, following completion of geotechnical and environmental borings on the site by the New Jersey Turnpike Authority, ruts and vegetation damage were observed in the area of Impoundment 3. Vehicle traffic and heavy equipment on the perimeter road had caused settlement of the road and ruts, causing the road to be depressed below the impoundment and adjacent land surface. This altered the site drainage allowing normal high tides to flood the road and the impoundment and allowing surface water to pool. Cytec contacted NJTA to perform the repairs under the conditions of their access agreement.

### 4.5 Remedial Actions Taken

The remedial actions taken at the Carteret Impoundments included vegetation of the impoundments, a five-year monitoring program for ground water and surface water, and a Declaration of Environmental Restriction (DER). A NFA was issued for the site in 2002 following completion of these remedial actions.

### 4.5.1 <u>Vegetation Activities</u>

During the 1970s numerous complaints were made regarding blowing dust from drying sludge in the impoundments. Anecdotal history of these complaints includes reduction in visibility on the nearby N.J. Turnpike from the blowing dust. In April 1978, the New Jersey Superior Court issued an Amended ACO that, among other items, required American Cyanamid to initiate a

program to establish suitable vegetation within the impoundments. The vegetation was required to prevent soil erosion in the then abandoned impoundments and to minimize wind erosion of the dried surface sediment.

In 1979 American Cyanamid began a study of methods for vegetating and stabilizing the sludge. Since the sludge was deficient of several essential nutrients, composted sewage sludge from Camden and Philadelphia was utilized as a base for vegetative growth. American Cyanamid began vegetating the impoundments in 1986, and by 1989 vegetation efforts were complete on all impoundments.

The vegetation efforts had limited long term success. At the present time the vegetation exists only on Impoundment 1 and portions of Impoundments 3, 4 and 5. Standing water exists on Impoundment 6 and portions of the other impoundments.

### 4.5.2 1995 Remedial Action Plan and Addendum

During the early 1990s, the site was investigated under the direction of the Site Remediation Program (SRP) at NJDEP. In 1994, Cytec proposed a remedial action plan consisting of an operation and maintenance program and a Declaration of Environmental Restriction (DER). In response to comments from SRP, Cytec issued a remedial action plan addendum on February 6, 1995 that added a five year groundwater and surface water monitoring program. The groundwater monitoring plan included the installation of three additional monitoring well pairs, including two well pairs near the Rahway River and a more definitive upgradient well pair. NJDEP approved the remediation of the site, based upon this remedial action plan and addendum.

The approved remedial action plan included the following engineering controls to be implemented at the site:

- Maintain the impoundments through quarterly inspections and performing general maintenance and repairs, as needed.
- Place signs along the Rahway River and Arthur Kill to deter trespassers
- Maintain locked gates at the two existing access points
- Fertilize and re-seed, as needed, to maintain vegetative cover
- Clear brush from the monitoring wells to allow access
- Place stone on access roads
- Repair tidal damage to the rip-rap containment system on the outsides of the berms

The monitoring plan conducted at the site consisted of sampling groundwater and surface water semi-annually for the first three years and annually for the last two years. The samples were analyzed for volatile organic compounds (VOCs) and inorganic constituents (aluminum, arsenic, total and free cyanide, iron, manganese, silver, and thallium). Trend analysis was

performed on the data using Mann-Kendall with the intent to establish a negative trend in the analyte concentrations.

NJDEP asked that additional groundwater and surface water sampling be performed following completion of the initial five year period, based upon the analytical results. This work was never performed. The groundwater sampling program was terminated in 2001, but no additional samples were collected after 1999. The surface water sampling program was terminated in 2002. Limited additional surface water sampling for manganese was performed between 1999 and 2002.

# 4.5.3 Declaration of Environmental Restrictions

On April 24, 1995, Cytec recorded a Declaration of Environmental Restrictions (DER) for the site in the Middlesex County Land records. The DER is recorded in Liber 4236, Folio 348. The DER is analogous to a Deed Notice, as currently described in the Tech Rule.

The DER covers all 21 parcels that comprise the project site and establishes that non-residential soil remediation standards would be the basis for site remediation. The DER established institutional controls for the site, references the approved remedial action plan and amendment and requires that any engineering controls implemented as part of the site remediation of the site be maintained.

The institutional controls established by the DER consist of:

- Restricted use of the site
- In the event of any emergency disturbance of the site, DEP must be notified immediately, the area and time of disturbance is limited to the minimums necessary to respond to the emergency, all measured necessary to limit exposures to human health and the environment must be implemented, the affected areas must be restored and a report must be provided to NJDEP.
- □ No alterations, improvements or disturbances of the site are allowed without prior written approval by NJDEP
- □ Signage along the Rahway River and Arthur Kill to prevent trespassing, as described in the approved remedial action plan and amendment

The DER is enforceable on the property owner, any lessees and NJDEP. The DER conveys with the property and is enforceable upon all future owners or operators of the property.

#### 4.5.4 No Further Action – Covenant Not to Sue

On September 24, 2002, DEP issued a Restricted Use No Further Action and Covenant Not to Sue (NFA&CNS) letter for the project site. This letter was issued at the request of Cytec, following completion of the groundwater monitoring program and acceptance of the results by DEP.

The NFA&CNS requires the property owner, and all subsequent property owners, to:

- Maintain the engineering and institutional controls to ensure they remain protective of human health and the environment
- Monitor the engineering and institutional controls for compliance and effectiveness and provide a written certification to DEP every two years that the engineering and institutional controls are being properly maintained and continue to be protective of public health, safety and the environment.

The NFA&CNS may be revoked by DEP if the engineering and institutional controls are not maintained and monitored.

## 4.6 Remedial Action Recommendations Not Performed

### 4.6.1 Dames & Moore 1979

In 1979 Cytec retained Dames and Moore to investigate the feasibility of growing vegetation on the impoundments to eliminate blowing dust. This work was performed in response to the 1978 ACO. In its report, Dames and Moore identified the difficulty of growing vegetation on the sludge and recommended a pilot program for growing phragmites on the sludge. A vegetation program was eventually implemented in the late 1980s, following placement of a thin layer of composted sewage sludge over the alum-YPS sludge.

Dames and Moore also recognized the potential for contaminated leachate discharge from the alum-YPS sludge to the groundwater and the Rahway River. It recommended a drainage system be designed and constructed to dewater the surface layers, particularly in Impoundments 4, 5 and 6. This drainage system was never built and water collected in the impoundments continues to leach through the sludge and discharge into the aquifer and the Rahway River.

## 4.6.2 Cytec 2004

In August 2004, Cytec and its consultants met with NJDEP Land Use Regulation Program (LURP) to discuss re-development of the project site. Included in the discussion was the requirement for additional remedial action and the fact that the existing site conditions did not meet the guidelines for capping the site. Placement of two or more feet of soil or fill was determined to be the suitable remediation measure for the site. The re-development plan for the site was never implemented and no additional capping material was placed over the impoundments.

#### 5. CONTAMINANT ASSESSMENT

# 5.1 Alum-YPS Sludge

### 5.1.1 Historic Data

Based upon the information contained in the literature search, the sludge in the impoundments was tested on several occasions. Analyses performed on the residue since the 1950s have shown a chemical composition of inorganic ions and salts characteristic of alum and YPS. The residue constituents are mainly gypsum, calcium carbonate, aluminum oxide, silica, sulfate and sodium. The sludge also contains volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), poly-chlorinated biphenyls (PCBs) and pesticides. The concentrations of these compounds were reported to be below the NJDEP non-residential remediation criteria.

Previous reports documented that the sludge is non-hazardous. In the 1986, Hydrosystems performed an Extraction Procedure Toxicity (EP-TOX) test for metals on sludge samples and judged the sludge to be non-hazardous. A desktop analysis was performed by BBL as part of the remedial action workplan to demonstrate that the sludge would be non-hazardous under the toxicity characteristics leaching procedure (TCLP). The highest measured concentrations from NJDEP's October 1991 sampling event were used, and the maximum potential leachate concentrations were calculated. The results showed that the sludge would not be hazardous under a TCLP analysis.

Cyanide was detected in samples of the sludge. Two sludge samples collected in Impoundment 3 in 1981 and one sludge sample collected in Impoundment 4 in 1991 had cyanide concentrations ranging from 1,020 mg/kg to 2,198 mg/kg. The current non-residential direct contact remediation standard for cyanide is 23,000 mg/kg and the default impact to groundwater standard is 13 mg/kg.

The form of cyanide has not been fully quantified, and it is possible that some forms could convert to free cyanide in the presence of sunlight (ultraviolet light), or when subjected to acidic conditions. The amount and type of cyanide forms present in the sludge and the potential adverse effect on the site redevelopment was not evaluated in these previous studies.

# 5.1.2 <u>March 2012 Sludge Samples</u>

In March 2012, EastStar collected three sludge samples, one each from Impoundments 3, 4 and 5 as part of an initial evaluation of the site. These samples were analyzed for TAL metals and cyanide.

The results showed that concentrations of aluminum, lead, manganese, mercury and cyanide exceeded either the non-residential direct contact remediation standards or the default impact to groundwater standards. Cyanide concentrations ranged from 547 to 1,570 mg/kg.

# 5.2 Fill Soil

## 5.2.1 Use of Fill Material

Undocumented fill materials have been placed on the site over the years to stabilize the dikes, provide work areas and bulk up the alum-YPS sludge in portions of the impoundments. Areas where fill was placed on the site were identified by review of historic documents regarding the site operations, historic aerial photographs and USGS topographic maps and discussions with the former landfill operator, and include:

- Berms and roads around portions of Impoundments 2, 3, 4 and 6, including the portions of the berms for Impoundments 3, 4 and 6 that abut the Rahway River. These areas were rebuilt using imported fill base material and were topped with recycled concrete as a wearing surface.
- Berms and roads dividing the internal portions of Impoundments 4, 5 and 6. These areas were rebuilt using railroad ties as a foundation, imported fill as a base material and recycled concrete as a wearing surface.
- □ Imported fill material mixed with alum/TSP sludge excavated from Impoundment 6 to stabilize the surface in most of Impoundment 2. Adjacent to the berm, this fill was placed on railroad ties. The remainder of the sludge/fill blend was placed directly on the impoundment surface.
- Fill material from a local construction project in the western one third of Impoundment 3
- Hundreds of excess railroad ties not used in the road reconstruction in Impoundment 5
- Digested biosolids (sewage sludge) from Philadelphia and Camden placed on top of the sludge in all of the impoundments to reduce blowing sludge dust and promote vegetative growth.
- □ Demolition debris from the former American Cyanamid Warner Plant used in the berm between Impoundments 3 and 6 and in Impoundment 2.
- Wood and wood chips from a Class B Recycling Facility and processing equipment operated on Impoundment 2 in the 2005-2006 timeframe.

The approximate fill areas were shown previously in Figure 4.5.

No environmental test data is available for review on any of the materials brought to the site. Additionally, no data is available regarding the materials received, processed or left on the site by the former Class B facility.

# 5.2.2 Analysis of Fill Material

Limited historic investigations of the fill material were performed by NJDEP as part of the site investigation in 1991 and N.J. Turnpike Authority in 2005. In both sampling events, measured PAH concentrations exceeded the non-residential direct contact remediation standards.

A more comprehensive evaluation of the fill material was performed by EastStar in 2011. In this investigation, 20 test pits were excavated around the site. Samples were collected from each test pit. All samples were analyzed for PAHs and RCRA metals. Selected samples were analyzed for petroleum hydrocarbons and cyanide.

The test pits showed that this fill material was ubiquitous throughout the site. The analytical results showed that the fill was contaminated with metals, PAHs, cyanide and petroleum hydrocarbons. The PAH contamination in the fill was wide-spread throughout the site. PAHs were measured at concentrations exceeding non-residential direct contact remediation standards in 14 of 20 samples. Two samples contained benzo(a)pyrene (BaP) at 49,700 ug/kg and 59,300 ug/kg. The highest measured BaP concentration is 300 times the remediation standard.

The widespread nature of the PAH contamination on the site is indicated by both the visual observations of the fill materials observed in the test pits and the analytical results. The results also confirm the previous NJDEP and NJ Turnpike Authority sample analyses that also showed PAH contamination on the site. The PAH contamination results from the fill investigation are shown on Figure 5.1 along with the limited results from the previous DEP and Turnpike Authority studies.

The contaminated fill is spread over the entire site including the berms, roads and the bio-solid cover material on the impoundments. The fill and the contamination cannot be isolated to a single area on the site. As a result, EastStar considers this fill to be a single area of concern, covering the entire 120 acre property.

Refer to EastStar's October 17, 2011 fill investigation report for details on the investigation, results and analyses.

### 5.3 Groundwater

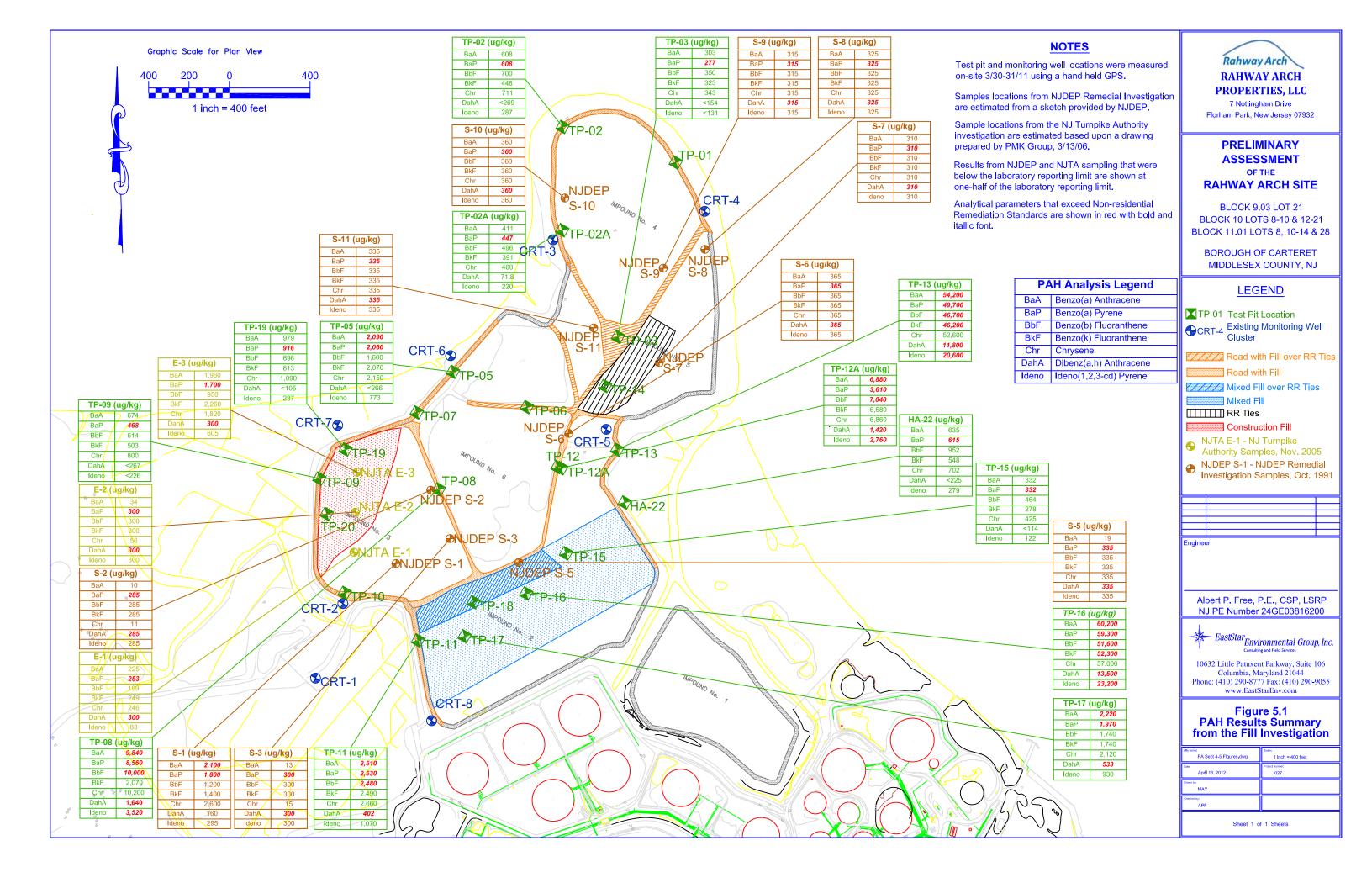
### 5.3.1 Groundwater Monitoring Programs

Originally, ten monitoring wells (5 well pairs, each pair consisting of 1 shallow and 1 deep monitoring well) were installed in the mid-1980s. These wells were sampled quarterly from 1987 through 1993 under a NJPDES-DGW permit. This permit was invalidated in 1990, but NJDEP advised Cytec to continue the sampling program. This sampling program was terminated after the Amended ACO was issued in 1993.

Three additional monitoring well pairs (3 shallow and 3 deep wells) were installed as part of the remedial action in 1995. The locations of the wells were previously shown on Figure 4.1. Between 1995 and 1999, groundwater monitoring was performed by sampling all 16 wells. The results of the monitoring reportedly did not exceed the Class III-B site specific groundwater quality criteria.

## 5.3.2 Groundwater Monitoring Results

The groundwater at the Carteret Impoundment site is classified as non-potable and is tidally affected by the Rahway River and the Arthur Kill. Therefore, site-specific Class III-B



groundwater quality criteria, following NJAC 7:9-6.7(f), were developed as part of the site remediation.

Potential impacts to groundwater quality from inorganic materials leaching through the sludge contained in the impoundments, consisted of constituents used in alum and YPS production and included aluminum, calcium, sodium, iron, cyanide, carbonate, and sulfate.

Elevated levels of chloride, sulfate and total dissolved solids (TDS) were detected in all of the shallow ground water samples. The previous investigations attributed these measurements to saline water intrusion from the Rahway River.

Volatile organic compounds (VOCs) and semi-volatile organic compounds (S-VOCs) were detected in monitoring wells CRT-1S and CRT-1D, which were designed to be the upgradient wells for the site. The previous investigations did not determine the source of these compounds, but speculated they were coming from the City of Carteret landfill. Well cluster CRT-8 was installed in 1995 and was designed to be a replacement upgradient well cluster rather than CTR-1.

Cyanide was detected in most of the shallow and deep wells. The previous reports indicated that the cyanide concentrations were less than the site specific Class III-B groundwater criteria of 6 mg/l.

In 1999, after five years of groundwater monitoring, Cytec terminated the groundwater monitoring program based on data that showed constituent concentrations below the site specific groundwater quality criteria. Trend analyses presented in the 1999 annual report did not show negative trends for all constituents, but this may have been attributable to the techniques used to analyze results that were below the laboratory reporting limits.

## 5.3.3 Current Conditions

The 16 groundwater monitoring wells have never been abandoned and remain open at the present time. Some deterioration was noted in the steel protective casings on both wells at CRT-6, which has been periodically inundated by brackish water from the Rahway River. Water was detected in all of the wells, which do not appear to have filled with sediment. Presumably, following re-development, these wells can continue to be used to monitor groundwater quality on the site.

#### 5.4 Surface Water

#### 5.4.1 Historic Discharges

Wastes from the Warner Plant were conveyed to the impoundment via an underground pipe system. In between the batch discharges of the slurried wastes, the pipeline was continuously purged with untreated water from the Arthur Kill to prevent the sludge from settling in the pipeline.

Supernatant from the slurried wastes and overflow from purging the pipeline drained to the Rahway River, immediately north of the impoundments. According to an undated NJDEP Case Transfer Document, the discharge to the Rahway was identified on Cyanamid's original July 10,

1974 NPDES permit application, and was later designated as Outfall 007. According to the permit application, contaminants known to be present in the discharge from Outfall 007 included, but were not limited to, cyanides, aluminum, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc. Cyanamid claimed that many of these contaminants were associated with the untreated Arthur Kill water used for purging the pipeline rather than the company's manufacturing processes.

American Cyanamid has also proposed using the impoundments for disposing of other waste streams from the Warner Plant, including phosphate wastes from incinerator scrubber systems. However, there is no information to indicate that this waste was disposed in the impoundments.

# 5.4.2 <u>Remedial Action Sampling</u>

In accordance with the 1995 remedial action plan addendum, surface water sampling was performed adjacent to Impoundment 1 at locations designated SW-1, SW-2 and SW-3. The analytical results of the surface water samples were compared to Saline Estuaries 3 (SE3) surface water quality criteria. Analyses showed that the concentrations of chloride, sulfate and TDS progressively increased in the direction of the junction of Deep Creek with the Rahway River. These constituents are most likely attributable to the influx of saline water from the tidal Rahway River.

Surface water samples were analyzed for VOCs, metals and total and free cyanide. VOCs were not detected in any of the surface water samples. Trace metals and inorganics, including aluminum, barium, calcium, total cyanide, iron, magnesium, potassium and sodium, were detected. However, manganese was the only constituent that exceeded the criterion for human health following the established surface water quality criteria.

In 1999 the NJDEP declined Cytec's petition to discontinue surface water monitoring because of elevated levels of manganese. Cytec performed additional surface water monitoring at SW-2 and SW-3. After the measured manganese levels were below the surface water quality criteria for two consecutive events, NJDEP approved terminating the surface water sampling and analysis program in September 2002.

It should be noted that the NJDEP approval for termination of the sampling was based on the levels of "free" cyanide detected in the groundwater and surface water samples. The possibility of other cyanides (that were captured in the total cyanide analysis) contributing to the toxicity of the discharges from the impoundments was not evaluated (YPS is known to convert into free-cyanide in the presence of sunlight or when subjected to acidic conditions).

## 5.4.3 March 2012 Water Samples

In March 2012, EastStar collected four water samples from standing water contained in three of the impoundments as part of an initial evaluation of the site. Two samples were collected from Impoundment 3 and one sample each was collected from Impoundments 4 and 6. These samples were analyzed for TAL metals and cyanide.

The results showed that concentrations of arsenic, copper, lead, thallium and cyanide exceeded the surface water quality criteria for SE water. Cyanide concentrations ranged from 3,980 mg/l to 43,200 mg/l. The cyanide concentrations are up to 308 times the surface water quality criteria.

#### 6. AREAS OF CONCERN

The 2006 PA report identified nine areas of concern. Each of those AOCs is presented here and recommendations are made regarding the need for further investigation for each AOC. EastStar's opinion, based upon review of existing site conditions and the available documents, regarding each of these AOCs has been added to the discussions. The recommendations provided for each AOC are EastStar's recommendation based upon the current site conditions and available information.

Additional AOCs have been identified as a result of EastStar's investigations, and are listed below starting with AOC 10.

The areas of concern have been shown on the site plans contained in this report.

# **AOC 1 - Sludge Chemical Constituents**

## Description:

In addition to the alum-YPS components, the sludge may contain other chemical constituents including sulfuric acid, acrylamide, polyacrylamide, methyl-bis-acrylamide, dimethyl phosphorochlorodithionate, surfactants, water/wastewater treatment chemicals, mining/ore production chemicals, organo-phospate pesticides, sodium hydrosulfide, disposal of phosphate waste associated with the incinerator scrubber, phosphorus pentasulfide, cyclohexane, naphthalene solvent and isobutyl alcohol. The Warner Plant produced a number of chemical products and had a number of waste streams. These additional constituents may be mixed with the sludge.

Undocumented fill has been placed on top of and mixed with the sludge as part of the vegetation efforts. Additionally, demolition debris from buildings at the Warner Plant were used in the berms. The fill and debris were never tested and are considered undocumented fill.

#### Recommendation:

Limited analytical data on the sludge is available. Sampling and analysis of a representative number of sludge samples for cyanide, TAL metals, S-VOCs, petroleum hydrocarbons and pesticides is recommended. See AOC 5 for additional discussion and recommendations on the undocumented fill.

## **AOC 2 - Residue Sludge Extent**

# Description:

The sludge is mostly contained within the soil berms. However, a review of historical boring logs in the vicinity of the berms identified a layer of sludge beneath the berms in some locations. In addition, historical reports indicate that in some areas, sludge likely extends beyond the present location of the berms resulting from several incidents of embankment failure. These failures are discussed in Section 4.4 of this PA.

### Recommendation:

The extent of the residue sludge below and beyond the impoundment berms should be further investigated. In addition to environmental impacts, sludge under the berms may also impact the stability of the berms as is discussed in AOC 3.

## AOC 3 - Residue Sludge and Containment Berm Stability

## Description:

The structural properties of the sludge are very poor. The sludge within the impoundments had negligible shear strength and is not capable of supporting any significant weight, including lightly loaded construction equipment. The sludge is sensitive and thixotropic.

The structural stability of the berms is questionable. Previous reports have documented past instances of failures.

The safety of the sludge impoundments and the berms is discussed in AOC 13.

## Recommendation:

Stabilization and/or solidification of the sludge is necessary for any site redevelopment, but will represent a very significant cost addition to any proposed site redevelopment plan. A geotechnical investigation will be necessary to evaluate the conditions within the impoundments.

The structural stability of the berms should be evaluated, and the berm containment system stabilized if necessary. A geotechnical investigation will be necessary to evaluate the condition of the berms.

## AOC 4 - Impacts to Surface Water Quality

#### Description:

The portion of the Rahway River that abuts the site is classified as SE3 (saline estuarine). The limited surface water quality data collected prior to issuance of the NFA indicates that cyanide and manganese were detected at concentrations that exceed the applicable most stringent surface water quality standard (SWQS). Specifically, the sampling performed during the remedial action in 1995 through 1999 detected cyanide at concentrations that ranged between 7.9 to 201 ug/l, exceeding the applicable SWQS that is protective of aquatic life of 1 ug/l. Manganese was also detected in these samples at concentrations that ranged between 33.9 to 189 ug/l, exceeding the applicable SWQS of 100 ug/l. Cyanide is a site-specific contaminant associated with the sludge and could be mobilized by storm water runoff and/or by discharge of shallow groundwater. The relatively high levels of manganese in the surface water were believed to be associated with the high levels of manganese characteristic of the regional groundwater. However, the sludge was not analyzed for manganese to determine if this was a site-specific contaminant.

A six inch transite pipe used to discharge sludge onto the site from the former American Cyanamid plant runs across the Rahway River. This pipe, if it was not removed or properly abandoned, may act as preferential pathway for migration of potential contaminants into the Rahway River. Also, NJDEP reported the existence of Outfall No. 7, the NJPDES

permitted outfall for discharging supernatant from the impoundments. Pieces of transite pipes were observed at the Rahway River adjacent to Impoundment 5 in 2012.

Discolored surface runoff was observed from the impoundments in 2012. Samples collected of water in the impoundments detected elevated concentrations of cyanide and metals, in excess of surface water quality criteria.

#### Recommendation:

Additional sampling of the surface water in the impoundments, the stormwater runoff and the adjacent water ways is recommended. Additional investigation to locate the pipe and the outfall and to further evaluate impacts to the Rahway River is also recommended.

Contaminated water is further discussed in AOC 11 - Contaminated Water in Impoundments.

## **AOC 5 - Fill Used to Construct Access Roads**

## Description:

Fill generated during the demolition of structures at the Warner Plant in Linden was used to construct and maintain the access roads around the embankments. This fill may be potentially impacted by historical operations associated with these structures. Other undocumented fill, including composed sewage sludge, C&D debris and excess soil excavated from re-development sites has been used on the berms and access roads over the years.

## Recommendation:

Sampling and analyses have shown that undocumented fill containing contaminants including PAHs above non-residential remediation criteria have been used over most areas of the site. See also AOC 1 and AOC 10.

#### **AOC 6 - Indoor Vapor Intrusion**

## Description:

Groundwater samples from monitoring wells MW-1S and MW-1D contain volatile organic compounds (VOCs), which exceed the applicable NJDEP Generic Vapor Intrusion Screening Levels for groundwater. These impacts were suspected to be associated with operations of Industrial Reclamation Service, an operator on the neighboring property or the Carteret landfill. The extent of the elevated levels of VOCs is not currently known.

# Recommendation:

See also AOC 12 - Contaminated Groundwater. As part of the site investigation recommendation described for AOC 12, additional groundwater sampling will be performed. This sampling will include analysis for VOCs. If the groundwater sampling results continue to show elevated VOC concentrations, delineation may need to be performed in accordance with the NJDEP Vapor Intrusion Guidance Document.

# **AOC 7 - Ecological Evaluation**

# Description:

The discharge of impacted groundwater into the surface water bodies in the vicinity of the site is possibly impacting the local ecology. The literature review did not identify any ecological studies of the site, with the exception of delineation of the extent of wetlands.

## Recommendation:

The potential for ecological impact will be determined as part of the recommendations for AOCs 3, 4, 10, 11 and 12. No additional investigations are recommended for this AOC at this time.

#### AOC 8 - Solid Waste

## Description:

A significant pile of railroad ties is located on Impoundment 5. Railroad ties were used to stabilize the access roads. This pile appears to be extra ties delivered to the site but not used.

Several piles of chipped wood waste along with scattered wood chips are located on Impoundment 2. These materials appear to be remnants of the wood waste recycling operation that was located on Impoundment 2 in 2005 through 2008.

#### Recommendation:

No further investigation to evaluate potential impacts from the railroad ties or wood waste is recommended at this time. However, proper handling and disposal of these materials should be part of the remedial action plan for the site.

#### **AOC 9 - Natural Resource Damages**

## Description:

A Natural Resource Damages assessment was not performed as a part of this PA or any previous investigations.

#### Recommendation:

No further investigation is recommended at this time.

## AOC 10 - Undocumented Fill

#### Description:

EastStar performed a fill investigation performed in 2011 and determined that, in addition to the alum-YPS sludge, undocumented fill materials have been placed over most of the site. Sampling and analysis of these fill materials determined that they are contaminated with PAHs, metals and petroleum hydrocarbons. PAH concentrations range up to 300 times the non-residential direct contact remediation criteria.

#### Recommendation:

The extent and condition of the fill material was well documented in the 2011 investigation. No further investigation of the fill material is warranted at this time, although remediation of this fill will be needed as part of the remedial action on the site.

## AOC 11 - Contaminated Water in Impoundments

## Description:

The impoundments act like bathtubs, trapping precipitation. This precipitation is forced to percolate through the contaminated fill and alum-YPS sludge into the groundwater. Alternatively during periods of heavy rainfall, this water will seep through the sides of the berms or will overtop the berms, threatening the berm stability.

Limited sampling performed in 2012 has shown that the water has dissolved contaminants from the impoundment contents. Elevated concentrations of cyanide and metals were measured in four samples collected from three of the impoundments in March 2012.

The only discharge paths for this contaminated water are into groundwater or surface water. EastStar estimates that 25,000,000 gallons per year of water will percolate through the sludge and enter the groundwater. In 1986, American Cyanamid's consultant Hydrosystems estimated this quantity could be up to 46,000,000 gallons per year and that the resulting discharge of cyanide could be 100 pounds per day. Hydrosystems calculated that this discharge exceeded the U.S. EPA reporting limit for cyanide discharge under the National Contingency Plan.

## Recommendation:

Additional sampling and analysis of this water is recommended to better characterize the contaminant concentrations and the probable discharge to groundwater quantities. The remedial action should be designed to eliminate the bathtub effects and prevent water from accumulating in the impoundments. A previous recommendation to control water in the impoundments was never implemented. A low permeability cap that is graded to promote runoff and prevent water from accumulating in the impoundments will provide the necessary control prevent water from percolating through the sludge into the groundwater and the Rahway River.

#### AOC 12 - Groundwater Contamination

#### Description:

Groundwater samples were last collected on the site in 1999. However, the contaminants in the sludge have remained exposed to infiltration since that time. As a result, the condition of the groundwater under the site is unknown at this time. The existing 16 groundwater monitoring wells installed by American Cyanamid and Cytec remain on the site. Although unused for a long time, in 2011 the wells were open and appeared to be usable.

# Recommendation:

Groundwater sampling and analysis are recommended to characterize the current groundwater conditions on the site. Since the existing wells have not been abandoned, they should be redeveloped and then sampled for organic and inorganic contaminants as part of the site investigation. The requirements for further investigation or any groundwater remedial action should then be based upon these results.

# AOC 13 - Public Safety from Exposed Sludge

## Description:

The sludge in the impoundments has no shear strength and will not support weight. This poses a direct safety hazard to any persons or animals that wander out onto the impoundments.

The remedial action plan and the DER discuss engineering controls to limit access by locking to two gates and posting no trespassing signage along the Rahway River and Arthur Kill. While the gates are locked, no signage was observed.

## Recommendation:

The requisite signage should be posted along the Rahway River and Arthur Kill to deter trespassers and the gates should be kept locked until additional remedial action is performed.

No further investigation is required at this time. However, stabilization of the sludge and the impoundments should be addressed as part of the remedial action. A geotechnical investigation, as discussed under AOC 3, will be necessary in order to develop the remedial design.

## AOC 14 - Former Wood Waste Recycling Facility

## Description:

A Class B recycling facility for recycling wood waste was operated on Impoundment 2 for several years. This facility had numerous permit violations, including several NOVs that remain outstanding at this time. As discussed in AOC 8, remnants of the operation are visible on the site at this time.

#### Recommendation:

The outstanding NOVs need to be resolved by the former Class B operator. Investigation of the former Class B operating area was included in the 2011 fill investigation (see AOC 10). No additional investigation is recommended at this time, although based upon the results of the fill investigation, remediation of this area will be required.

#### 7. REFERENCES

- 1. Technical Requirements for Site Remediation, NJAC 7:26E, last amended May 7, 2012.
- 2. SESI Consulting Engineers, *Preliminary Assessment Report of American Cyanamide/Cytec Impoundments*, Draft, October 27, 2006.
- 3. Environmental Data Resources, Inc., EDR Radius Map Report with GeoCheck of the Rahway Arch Site (former American Cyanamide), June 14, 2010.
- 4. Environmental Data Resources, Inc., Sanborn Fire Insurance Map Search Report of the Rahway Arch Site (former American Cyanamide), June 14, 2010.
- 5. Environmental Data Resources, Inc., EDR Aerial Photo Decade Package Report of the Rahway Arch Site (former American Cyanamide), June 14, 2010.
- 6. Environmental Data Resources, Inc., EDR Historical Topo Map Report of the Rahway Arch Site (former American Cyanamide), June 14, 2010.
- 7. NJDEP, Letter from Kenneth Kloo to Angela Dohl, American Cyanamid Company, with attachments, December 6, 1991.
- 8. Cytec Industries, Remedial Action Plan: Operation, Maintenance and Monitoring for Carteret Impoundments, Borough of Carteret, New Jersey, April 21, 1994.
- 9. Blasland, Bouck & Lee, Inc., Remedial Action Plan Addendum: Carteret Impoundments, Borough of Carteret, New Jersey, revised February 1995.
- 10. Blasland, Bouck & Lee, Inc., Remedial Investigation Work Plan: Carteret Impoundments, Borough of Carteret, New Jersey, December 1993.
- 11. New Jersey Turnpike Authority, Letter from Kathy Critchley to Thomas J. Irwin, Cytec Industries, with attachments, July 15, 2010.
- 12. Hydrosystems, Inc., Groundwater and Surface Water Assessment Carteret Impoundments, American Cyanamid Company, Linden, New Jersey, February 9, 1987.
- 13. Hydrosystems, Inc., Environmental Assessment of the Carteret Impoundments, American Cyanamid Company, Linden, New Jersey, March 10, 1989.
- 14. EastStar Environmental Group, Inc., Environmental Investigation of Fill Material at the Rahway Arch (Old Cytec Landfill) Site, October 17, 2011.
- 15. NJDEP-Site Remediation Program, Fill Guidance at SRP Sites, August 11, 2011.
- 16. Grayson, Linda, NJDEP Internal Memorandum, Case Transfer Memorandum ACO Negotiation Case American Cyanamid Landfill, undated.

See also documents list in Appendix A for complete list of documents reviewed in preparation of this Preliminary Assessment

**APPENDICES** 

# **APPENDIX A**

# **DOCUMENTS REVIEWED IN**

PREPARATION OF THIS PRELIMINARY ASSESSMENT

	Title/Subject	Author	Recipient	Date
001	Sludge Report, Analysis	Jersey Testing Laboratories Inc.	Borough of Carteret, NJ	February 12, 1959
002	Toxicity Data – CYANOGAS G-FUMIGANT	American Cyanamid	American Cyanamid	December 21, 1967
003	Preliminary Study Revegetation of Sludge Impounds	Dames & Moore	American Cyanamid Company	November 16, 1979
003	Plan for Test Plot Development, Seeding and Growth Monitoring Revegetation of Sludge Impounds	Dames & Moore	American Cyanamid Company	April 1981
005	Plan for Test Plot Development, Seeding and Growth Monitoring Revegetation of Sludge Impounds	Dames & Moore	American Cyanamid Company	May 1981
006	Investigation into the Permeability of Sludge Impounds at the Warners Plant	M. Disco Associated, Union, NJ	Gerald Friedman, ACCO	June 08, 1981
007	Preliminary Report of Soil Borings and Measurement of Permeabilities at the Warner's Plant Impounds	M. Disko Associates	Michael Caponegro – American Cyanamid Company	September 1981
008	Phase II Test Plot Results and Revegetation Recommendations	Dames & Moore	American Cyanamid Company	December 1981
009	Preliminary Report of Test Borings and Dike Evaluation at the Warner's Plant Impounds	M. Disko Associates	American Cyanamid Company	January 1982
010	Erosion control, Revegetation, seagull issue	J. B. Halladay, Plant Manager, ACCO	Francis Cap, Sanitary Inspector	February 26, 1982
011	NPDES Permit Requirements	A.A. Groeller, Manager, Env. Services, ACCO	John Trela, Chief , Groundwater Permits, NJDEP	June 22, 1982.
012	NJPDES Permit No. NJ 0061611	Robert Berg, NJDEP	A. Groeller, American Cyanamid	August 28, 1986

	DOROGOTOT GARTERET, NEW GERGET				
	Title/Subject	Author	Recipient	Date	
013	Map showing sampling locations in Rahway River w/analytical data	Hydrosystems, Lyle R. Silka	Daniel Callahan, ACCO	November 21, 1986	
014	Groundwater and Surface Water Assessment, Carteret Impounds	Hydrosystems, Lyle R. Silka, Sr. Hydrogeologist	Margaret Tribble, American Cyanamid	February 09, 1987	
015	American Cyanamid Company – Warners Plant Carteret Landfill, NJPDES Permit No. 0061611 – Groundwater Monitoring Wells	Alice E. Boomhower, American Cyanamid	George Caporale, NJDEP	December 28, 1987	
016	Decision approving settlement in the matter of American Cyanamid Company Sanitary Landfill, Carteret	Ronald Parker, NJ Office of Administrative Law	Joseph Childs, ACCO	January 06, 1988	
017	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring	Alice E. Boomhower, American Cyanamid	Brenda Jordan, NJDEP	February 25, 1988	
018	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-00	Alice E. Boomhower, American Cyanamid	George Caporale, NJDEP	March 22, 1988	
019	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-01	Alice E. Boomhower, American Cyanamid	Ruth Foster, NJDEP	April 28, 1988	
020	American Cyanamid Soil Erosion and Sediment Control Plan	Alice E. Boomhower, American Cyanamid	Richard Ambrosio, Freehold Soil Conservation District	May 10, 1988	
021	Compost Application and Soil Erosion and Sedimentation Plan for American Cyanamid	Alice E. Boomhower, American Cyanamid	Timothy Ruby, NJDEP	May 10, 1988	
022	ACCO Carteret Landfill, Site Visit May 25, 1988	Alice E. Boomhower, American Cyanamid	Timothy Ruby, NJDEP	May 26, 1988	

	Title/Subject	Author	Recipient	Date
023	Environmental Assessment of the Carteret Impoundments, American Cyanamid, Linden, NJ	Hydrosystems, Inc., Dunn Loring, VA 22027	Margaret Tribble, American Cyanamid	June 03, 1988
024	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-02	Alice E. Boomhower, American Cyanamid	George Caporale, NJDEP	June 30, 1988
025	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-03	Alice E. Boomhower, American Cyanamid	George Caporale, NJDEP	September 23, 1988
026	Approx. 25 photos taken of Carteret Landfill area	DPS Studio, Linden, NJ	American Cyanamid	October 31, 1988
027	Pre application conference, Coastal Application Inquire P#2097, Carteret Landfill	Charlie Welch, NJDEP	Alice Boomhower, ACCO	November 28, 1988
028	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-04	David Stein, American Cyanamid, unsigned	George Caporale, NJDEP	December 28, 1988
029	Soil Erosion and Sediment Control Plan for Vegetation and Maintenance of containment Berms at the American Cyanamid, Carteret Facility, Phase III, 1989 (large map attached)	John DiPalma, ACCO, Technical Manager	Freehold Soil Conservation District	January 10, 1989
030	Environmental Assessment of the Carteret Impoundments	Lyle R. Silka – Hydrosystems, Inc.	Alice Boomhower – Warners Plant – American Cyanamid Company	March 10, 1989
031	NJDPES Permit Renewal Application	G. Campbell, ACCO	J. Reid, ACCO	March 22, 1989
032	NJPDES Permit No. NJ0061011, Renewal Permit Application (w/o attachments)	R. Tabakin, ACCO	Bureau of Permits, Trenton, NJ	March 30, 1989

		,		
	Title/Subject	Author	Recipient	Date
033	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-05	Alice E. Boomhower, American Cyanamid	George Caporale, NJDEP	March 30, 1989
034	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring	Angela Dohl, American Cyanamid	George Caporale, NJDEP	March 30, 1989
035	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-06	Alice Boomhower, American Cyanamid	George Caporale, NJDEP	May 25,1989
036	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring Analytical Results	Alice Boomhower, American Cyanamid	George Caporale, NJDEP	June 28, 1989
037	Chain of custody form, Lab	Environmental Testing and Certification (ECT)	Alice Boomhower, ACCO	July 11, 1989
038	Data Management Summary Report	Environmental Testing and Certification (ECT)	American Cyanamid	August 16, 1989
039	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-07	Alice Boomhower, American Cyanamid	George Caporale, NJDEP	September 28, 1989
040	ACCO, Warners Plant, Carteret Landfill, NJPDES Permit No. 0061611, Groundwater Monitoring-08	Angela Dohl, American Cyanamid	George Caporale, NJDEP	December 20, 1989
041	Landfill Name: American Cyanamid Company, NJ Discharge Elimination System/Discharge to Ground-Water Permit – notification that permit invalid effective April 19, 1989	Arnold Schiffman, NJDEP	American Cyanamid Company	February 06, 1990
042	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring	Angela Dohl, American Cyanamid	George Caporale, NJDEP	March 30, 1990
043	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-00	Angela Dohl, American Cyanamid	George Caporale, NJDEP	June 19, 1990

	BONGGOTTO GANTENET, NEW GENGET				
	Title/Subject	Author	Recipient	Date	
044	Administrative Consent Order (Warners Plant Site)	State of NJDEP	American Cyanamid Company	August 23, 1990	
045	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-01	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP	September 14, 1990	
046	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-02	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP	December 18, 1990	
047	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-03	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP	March 21, 1991	
048	Carteret Landfill, NJPDES Permit No. 0060611, Monitoring Certification	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP	March 28, 1991	
049	Carteret Landfill Inspection – Phase I Plan for Revegetation	Angela Dohl, American Cyanamid	Donna van Veldhuisen, NJDEP	April 23, 1991	
050	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-04	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP	June 10, 1991	
051	Preliminary Assessments for Carteret Landfills	Donna van Veldhuissen, NJDEP	Angela Dohl, ACCO	July 03, 1991	
052	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-05	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP and Energy	September 13, 1991	
053	Analytical report to sampling performed at Impounds 2,3,4,5 on October 24, 1991	Kenneth Kloo, Section Chief, NJDEP	Angela Dohl, ACCO	December 06, 1991	
054	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-06	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP and Energy	December 20, 1991	
055	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-07	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP and Energy	March 24, 1992	

	Title/Subject	Author	Recipient	Date
056	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-08	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP and Energy	June 05, 1992
057	Carteret Landfill, NJPDES Permit No. 0060611, Groundwater Monitoring-09	Angela Dohl, American Cyanamid	Arnold Schiffman, NJDEP and Energy	September 10, 1992
058	Groundwater Analysis – Monitoring Well Report (Oct-Dec. 1992)	American Cyanamid Company	NJDEP	December 1992
059	Amendment to Administrative Consent Order (see ACO August 23, 1990)	State of NJDEP	American Cyanamid Company	July 06, 1993
060	Remedial Investigation Work Plan	BBL	Haiyesh Shah – NJDEP; Cytec Industries Inc.	December 1993
061	Deed			December 17, 1993
062	American Cyanamid Carteret Impoundments Site (RIWP Comments – December 2, 1994)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	February 18, 1994
063	Remedial Action Plan: Operation, Maintenance, and Monitoring for Carteret Impoundments	Joel Jerome – Cytec	Haiyesh Shah – NJDEP	April 21, 1994
064	Cytec Carteret Impoundments Site (RAP – April 21, 1994)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	May 02, 1994
065	Remediation Plan Implementation, Carteret Impounds	BBL	Joel Jerome, Cytec	May 20, 1994
066	Remedial Action Plan Addendum	BBL	Cytec Industries Inc.	November 1994
067	Remedial Action Plan Addendum-00	BBL	Cytec Industries Inc.	November 1994 Rev. February 1995

	Title/Subject	Author	Recipient	Date
068	Cytec Carteret Landfill (Impoundments) Site (RAP Addendum – November 1994)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	November 29, 1994
069	Cytec Carteret Impoundments (Landfill) Site, Carteret Borough, Middlesex Co.	Haiyesh Shah, Case Manager, NJDEP	Joel Jerome, Cytec	February 06, 1995
070	Declaration of Environmental Restrictions		Dennis L. Little – Middlesex County Clerk	May 04, 1995
071	Cytec Carteret Impoundments Site (Annual Report for Semi- Annual Monitoring and Maintenance for Year 1995 – March 1996)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	March 19, 1996
072	Annual Report Ground-Water & Surface Water Monitoring	BBL	Cytec Industries Inc.	February 1997
073	Cytec Industries Inc. – Carteret (re National Heritage Database)	Elena A. Williams – NJDEP	Michael P. Fleischner – BBL	May 02, 1997
074	Dredge Materials Project	Joel Jerome – Cytec	David Rislia – NJDEP	June 25, 1997
075	Results of June 1997 Ground-Water/Surface Water Sampling Event	BBL	Cytec Industries Inc.	August 1997
076	Cytec Carteret Impoundments Wetlands Status	Joel Jerome – Cytec	David Rislia – NJDEP	August 29, 1997
077	Cytec Carteret Impoundments Site (Third Annual Maintenance and Monitoring Report – August 1997)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	September 17, 1997
078	New Jersey Freshwater Wetlands Protection Act, Letter of Interpretation	Shisler Environmental Consultants, Inc.	Chris Jones – NJDEP	November 05, 1997
079	Letter of Interpretation, Line Verification	Christopher Jones – NJDEP	Andrew N. Johnson, P.E. – BBL	March 13, 1998

	BOROGOTI GI GARTERET, NEW GERGET				
	Title/Subject	Author	Recipient	Date	
080	Letter of Interpretation, Line Verification-00	Joel Jerome – Cytec	Christopher Jones – NJDEP	March 25, 1998	
081	Cytec Carteret Impoundment Site (Tech. Requirements)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	May 05, 1998	
082	Repair and Maintenance of Impoundment 1 Berm	Michael J. McNally – BBL	Chris Jones – NJDEP	July 22, 1998	
083	Annual Monitoring Report FOR 1998	BBL	Cytec Industries Inc.	September 1, 1998	
084	Cytec Carteret Impoundment Landfill Site	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	September 8, 1998	
085	Cytec Carteret Impoundment Landfill Site (Annual Monitoring Report for 1998 –September 1998)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	November 4, 1998	
086	Deed between Cytec and Carteret Development LLC			August 17, 1999	
087	Annual Monitoring Report for 1999	BBL	Haiyesh Shah – NJDEP; Cytec Industries Inc.	September 1999	
088	Carteret Waterfront Development Application	Michael J. McNally – BBL	Joel Jerome – Cytec	October 28, 1999	
089	Carteret Development LLC – Carteret Facility – Dredge Material Project – Application for Waterfront Development Permit, Wetland Permit, and Acceptable Use Determination	BBL		November 1999	
090	Cytec Carteret Impoundment Landfill Site (1999 Annual Monitoring Report – September 1999)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	December 12, 2000	
091	1999 Annual Monitoring Report	Joel Jerome – Cytec	Haiyesh Shah – NJDEP	February 20, 2001	

	Title/Subject	Author	Recipient	Date
092	Cytec Carteret Impoundment Landfill Site (Response to Comments Letter – February 20, 2001)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	May 22, 2001
093	1999 Annual Monitoring Report – Response to NJDEP Comments – May 22, 2001	Joel Jerome – Cytec	Haiyesh Shah – NJDEP	June 25, 2001
094	Cytec Carteret Impoundment Landfill Site (Response to Comments Letter – June 25, 2001)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	September 25, 2001
095	Cytec – Carteret Surface Water Monitoring	Kris Hallinger	Paul Mlodzinski and Christine Napoletano – BBL	September 27, 2001
096	2001/2002 Surface Water Monitoring Results	Joel Jerome – Cytec	Haiyesh Shah – NJDEP	July 17, 2002
097	Request for No Further Action (Soil Investigation and Remediation	Alain Hebert, BBL	Haiyesh Shah – NJDEP	July 23, 2002
098	Cytec Carteret Impoundment Landfill Site (Sampling and Analysis Results of Surface Water – July 17, 2002)	Haiyesh Shah – NJDEP	Joel Jerome – Cytec	September 09, 2002
099	Request for No Further Action Letter and Covenant Not to Sue	Kris D. Hallinger – BBL	Haiyesh Shah – NJDEP	September 19, 2002
100	Carteret Impoundments Site, Carteret Borough, Middlesex County – Restricted Use – No Further Action Letter and Covenant Not to Sue – Entire Site	Bruce Venner – NJDEP	Joel Jerome – Cytec	September 24, 2002
101	Carteret Impoundments Site, Carteret Borough, Middlesex County – Restricted Use – No Further Action Letter and Covenant Not to Sue – Entire Site-2	Joel Jerome – Cytec	Haiyesh Shah – NJDEP	October 02, 2002

	Title/Subject	Author	Recipient	Date
102	Meeting notes and follow up from November 15, 2002 meeting re Carteret (note BBL Confidential Work Product ) includes maps – Impound cross- section locations	BBL	Joel Jerome, Cytec, Yurchuck, NA Realty A. Herbert, BBL	November 15, 2002
103	Freshwater Wetlands Letter of Interpretation Extension	BBL	Borough of Carteret – Municipal Clerks Office; NJDEP	February 2003
104	Pre-Application Meeting Request for Cytec Industries Inc. Property in Borough of Carteret, Middlesex County, New Jersey	Alain P. Hebert – BBL	Chris Jones – NJDEP	February 26, 2003
105	Site Development Information Package	BBL		March 2003
106	Pre-Application Meeting Request for Cytec Industries Inc. Property in Borough of Carteret, Middlesex County, New Jersey	Alain P. Hebert – BBL	Chris Jones – NJDEP	April 02, 2003
107	Cytec Carteret LOI Extension	Alex B. Francisco - BBL	Alyson Giehl – NJDEP	May 12, 2003
108	Waterfront Development/Coastal Wetlands Permit Application	BBL	NJDEP Land Use Regulation	October 2003
109	Waterfront Development/Coastal Wetland Permit Application	Joel Jerome – Cytec	NJDEP Land Use Regulation	October 21, 2003
110	Waterfront Development Permit	Joel Jerome – Cytec	Alison Giehl – NJDEP	January 23, 2004
111	Land use Regulation Program – Waterfront Development Permits	Allison Giehl, NJDEP	Joel Jerome, Cytec Industries Inc.	February 18, 2004
112	Application for Freshwater Wetland Letter of Interpretation Extension	Joel Jerome – Cytec	Chris Jones – NJDEP	June 10, 2004
113	Pre-Application Meeting Request	Alain P. Hebert – BBL	Chris Jones – NJDEP	August 6, 2004

	BONGGOTTOT GARTERET, NEW GERGET					
	Title/Subject	Author	Recipient	Date		
114	Pre-Application Meeting, Proposed Redevelopment of Carteret Development LLC Impoundments	BBL	NJDEP	August 31, 2004		
115	Preliminary Geotechnical Evaluation and Test Fill Recommendations	Gerry Coscia, P.E.; Kenneth A. Huber, P.E.; Christian B. Woods Langan Engineering & Environmental Services	Bernie Langan, P.E.	December 27, 2004		
116	Draft Waterfront Development Permit Application	BBL		January 2005		
117	Test Fill Location Plan with CD attached	Chris Woods – Langan Engineering & Environmental Services	Alain Hebert , P.E. – BBL	January 11, 2005		
118	Evaluation of Wetland Resource value classification	BBL	Cytec Industries Inc.	February 01, 2005		
119	Field Inspection – Carteret Impounds	BBL	Cytec Industries Inc.	February 21, 2006		
120	Line Verification – Reissuance	Christopher Jones – NJDEP	Andrew Johnson – BBL	February 26, 2006		
121	Biennial Certification Monitoring Report From for a Deed Notice and Engineering Control- 2006	K, Barney, Carteret Municipal Clerk	BBL	December 18, 2006		
122	Easement Agreement (Recorded) from Titan-PDC Carteret Urban Renewal LLC to Carteret Development LLC	Titan-PDC	Carteret Development LLC	January 17, 2007		
123	Landfill District Development Area Phase 2 Area Assessment Report (Draft)	Beacon Planning and Consulting Services, LLC, Colts Neck, NJ	Members of Carteret Governing Body; Members of Carteret Planning Board as well as Planning Board Clerk, Attorney and Engineer	June 2007		
124	Attachments to Landfill Phase 2 Area Assessment Report	Beacon Planning and Consulting Services, LLC, Colts Neck, NJ	Members of Carteret Governing Body; Members of Carteret Planning Board as well as Planning Board Clerk, Attorney and Engineer	June 2007		

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	Title/Subject	Author	Recipient	Date
125	Budget Amendment Request for Carteret	Arcadis, Gary Wroblewski	G. Boyle, Cytec Industries Inc.	November 6, 2007
126	November 19, 2007 Site Inspection Carteret Impounds	Arcadis, Alain. Herbert	G. Boyle, Cytec Industries Inc.	November 29, 2007
127	Waters-Wetlands Delineation Carteret Impounds	Arcadis, Doug Partridge	G. Boyle, Cytec Industries Inc.	December 18, 2007
128	January 16, 2008 Site Inspection of Cytec Carteret Impound 2	Arcadis, Alain Herbert	G. Boyle, Cytec Industries Inc.	January 29, 2008
129	Berm Distances and Wetlands map of Carteret Impoundment I and 2	Arcadis, Doug Partridge	G. Boyle, Cytec Industries Inc.	February 22, 2008
130	Carteret Notice of Public Hearing for January 23, 2008	Borough of Carteret, M. Keratt, Planning Board Clerk	Property Owners	January 11, 2009
131	Transcript Planning Board 1/23/2008		Borough of Carteret Planning Board	January 23, 2009
132	Third –Party Complaint - Docket No. ESX-L-9868-05 NJDEP v. Occidental Chemical Corporation, et al	Drinker Biddle & Reath LLP attorneys for Defendants Maxim Engergy Corporation and Tierra Solutions, Inc.	Cytec Industries Inc.	February 4, 2009
133	Biennial Certification Monitoring Report From for a Deed Notice and Engineering Control -2009	Arcadis	K, Barney, Carteret Municipal Clerk; E. Flynn, Middlesex County Clerk; E. Ransdell, Carteret Brd of Health; D. Pari, Middlesex Health Dept; and Carteret Development LLC	April 2009
134	Objection Letter to Hearing	McKirdy & Riskin, P.A. (copy of letter to recipients unsigned version)	J. Clarkin, Planning Board Attyn, Carteret; R. Bergen, Borough of Carteret Attny; M. Keratt, Carteret Planning Brd. Clerk, K. Barney, Borough of Carteret Municipal Clerk	January 2009 (doc prints out April 20, 2009)

# FILE INDEX ADDITIONAL FILES FROM BILL ROBERTS DECEMBER 2011 CARTERET IMPOUNDMENTS BOROUGH OF CARTERET, NEW JERSEY

		,		
	Title/Subject	Author	Recipient	Date
201	Aerial Photo Showing Carteret Properties	Princeton Hydro		March 2, 2010
202	Tideland Claim Search	Charles Jones	Anne Marie, New American Title Group, LLC	June 18, 2009
203	Due Diligence Screening Memo	Princeton Hydro		July 2, 2009
204	Title Survey Sheet 0001	Keller and Kirkman		September 29, 2006
205	Title Survey Sheet 0002	Keller and Kirkman		September 29, 2006
206	Title Survey Sheet 0003	Keller and Kirkman		September 29, 2006
207	Alta Title Survey Drawing sheet 1	Keller and Kirkman		October 26, 2006
208	Alta Title Survey Drawing sheet 2	Keller and Kirkman		October 26, 2006
209	Alta Title Survey Drawing sheet 3	Keller and Kirkman		October 26, 2006
210	Preliminary Assessment Report for American Cyanamid/ Cytec Impoundments	SESI Consulting Engineers	Titan PDC Carteret II, LLC	October 30, 2006
211	Cytec Carteret Survey (AutoCAD)	Crest Engineering Associates		August 7, 1997
212	NJ Turnpike Soil Borings and Lab Report	Kathy Critchley, New Jersey Turnpike Authority	Thomas J. Irwin, Cytec	July 15, 2010
213	NJ Turnpike Taking of Property		Titan PDC Carteret Urban Renewal, LLC	January 18, 2008

# FILE INDEX ADDITIONAL FILES FROM BILL ROBERTS DECEMBER 2011 CARTERET IMPOUNDMENTS BOROUGH OF CARTERET, NEW JERSEY

		,		
	Title/Subject	Author	Recipient	Date
214	NJDEP PAH Analysis Results (extracted from larger report)	Kenneth J. Kloo, NJDEP	Angela Dohl, American Cyanamid Company	December 6, 991
215	Conceptual Wetlands Sketch	none		none
216	Conceptual Wetlands Sketch with topo	none		none
217	Tremley Point Road Connector Project Appendix E – Remedial Investigation Report	Eric Meyer, PMK Group	Neil Tolgia, Edwards and Kelcey	July 20, 2006
218	Carteret Impoundment Field Activities	MDH, BBL	MJM, BBL	July 9, 1997
219	Test Results for Carteret Landfill	Greg Thomas, Woodward Clyde	Raymond Dhollander, BBL	July 8, 1997
301	LOI Verification Application	Douglas Partridge, Arcadia US	George Ververides, Middlesex County Planning Board	May 1, 2008
302	Existing Site Conditions, Wetland Boundary and Transition Area (drawing)	BBL		March 1, 2006
303	Delineation of Waters of the State for LOI Application	Douglas Partridge, Arcadia US	Carteret Development LLC	April 28, 2008
304	LOI – Line Verification	John King, NJDEP	Gary Wroblewski, Arcadis US	September 22, 2008
305	Wetlands Map with field notes	Arcadis US		May 2008
401	Carteret Terminal Public Notice	Stantec Consulting Corporation	Carteret Development LLC	September 1, 2009
402	Carteret Titan Redevelopment Agreement			February 6, 2004

# APPENDIX B

CURRENT DEED FOR THE SITE

#### MIDDLESEX COUNTY CLERK

#### Return To:

WEINER LESNIAK 629 PARSIPPANY RD PARSIPPANY NJ 07054 ATTN: LOUIS I KARP

CARTERET DEVELOPMENT LLC

RECORDING	\$	140.00
NJPRPA	\$.	46.00
DARM	\$	69.00
DARM 3.00	\$	3.00
NJPRPA	\$	2.00
GRANTEE TX	\$	.00
	\$	.00
DD4 T1 CO	\$	150.00
DD4 T1 ST	\$	375.00
All Other	\$	27,203.00
Total:	\$.	27,988.00

STATE OF NEW JERSEY MIDDLESEX COUNTY CLERK

> ELAINE FLYNN COUNTY CLERK



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Index DEED BOOK

Book 06127 Page 0864

No. Pages 0024

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RECORDED ELAINE H FLYNN ILJELESEX CTY CLERK

## **RECORD AND RETURN TO:**

Louis I. Karp, Esq. Weiner Lesniak LLP 629 Parsippany Road P.O. Box 438 Parsippany, New Jersey 07054

DEED

THIS DEED is dated January 15, 2010,

BETWEEN

CARTERET DEVELOPMENT LLC, a Delaware limited liability company having an address of Five Garret Mountain Plaza, Woodland Park, New Jersey 07424 (the "Grantor"),

AND

**RAHWAY ARCH PROPERTIES, L.L.C.**, a New Jersey limited liability company having an address of 7 Nottingham Drive, Florham Park, New Jersey 07932 (the "Grantee").

- 1. <u>Transfer of Ownership</u>. In consideration for the sum of Two Million Five Hundred Thousand (\$2,500,000.00) Dollars, the receipt and sufficiency of which are hereby acknowledged, the Grantor hereby sells, grants and conveys the Property (as defined below) to the Grantee.
- 2. <u>Tax Map Reference</u>. The Property is known and designated as Block 9.03, Lot 21; Block 10, Lots 8-10 and 12-21; and Block 11.01, Lots 8, 10-14 and 28 on the official tax map of the Borough of Carteret.
- 3. Property. The property conveyed by this Deed (the "Property") consists of the land, together with all of the buildings, improvements and other fixtures on the land and all of the Grantor's rights relating to the land, located in the Borough of Carteret, County of Middlesex and State of New Jersey. The legal description of the Property is as follows:

See Schedule A attached hereto and made a part hereof.

BEING the same property conveyed to the Grantor herein by deed from Cytec Industries Inc. dated August 17, 1999 and recorded on September 15, 1999 in the office of the Clerk of Middlesex County, New Jersey in Deed Book 4683, Page 327.

THIS CONVEYANCE IS SUBJECT TO (i) municipal zoning ordinances and other applicable federal, state and local laws, ordinances, regulations and requirements, (ii) current taxes not due and payable, (iii) the DER, the NFA and the ACO (as such terms are defined below), (iv) the Access Agreement dated the date hereof between the Grantor and the Grantee and about to be recorded immediately after the recordation of this Deed, (v) the easements, covenants, restrictions and other encumbrances more fully described on Schedule

23/08/3

B attached hereto and made a part hereof and (vi) any and all matters relating to tidelands, riparian rights or wetlands.

- 4. As-Is Condition. This conveyance is further subject to the following terms, conditions, limitations, qualifications and agreements. Certain capitalized terms used in this Deed are defined in subparagraph 4(j) below. All other capitalized terms used in this Deed and not otherwise defined in this Deed have the meanings given to such terms in the Agreement of Purchase and Sale dated June 8, 2009 between the Grantor and the Grantee, as amended through the date hereof (collectively, the "Agreement").
- (a) General. The Grantee acknowledges that it has agreed to accept the Property based upon its own Inspections and the Grantee's independent investigations, it being understood and agreed that the Grantor is selling the Property and the Grantee is buying the Property "As-Is, Where-Is and With All Faults." The Grantee has not relied on any representations, warranty, promise or statement, express or implied, of the Grantor, or anyone acting for or on behalf of the Grantor, other than as may be expressly set forth in the Agreement, and all matters concerning the Property have been independently verified by the Grantee prior to the date hereof, and the Grantee is purchasing the Property on the Grantee's own prior investigation and examination of the Property (or the Grantee's election not to do so).
- (b) <u>Disclaimers.</u> Except as expressly set forth to the contrary in the Agreement, the Grantor makes no warranty, guaranty or representation, and hereby specifically disclaims any warranty, guaranty or representation, oral or written, express or implied, past, present or future, of, as to or concerning (i) the nature, condition or status of the Property, including without limitation the existence or non-existence of any environmental condition on the Property and any warranty of habitability, merchantability or fitness for a particular purpose, (ii) the nature and extent of any matter affecting title to the Property, including without limitation any easement, right-of-way, possession, lien, encumbrance, license, restriction or reservation affecting, burdening or benefiting the Property, (iii) the compliance of the Property or any portion or portions thereof with any laws, ordinances, rules or regulations of any governmental or other body, including without limitation any laws, ordinances, rules, or regulations relating to (a) the environment or the impairment thereof or (b) zoning or land use matters, (iv) leases or other agreements, written or oral, regarding the use, occupancy or possession of the Property or any portion thereof, (v) the suitability of the Property for any and all activities and uses which the Grantee may conduct thereon, (vi) the manner, quality, state of repair or lack of repair of the Property or (vii) any other matters with respect to the Property.
- (c) Reliance on Grantee's Inspections. Prior to the date hereof, the Grantee has had the opportunity to investigate all physical, environmental and economic aspects of the Property and to make all inspections and investigations of the Property which the Grantee deemed necessary and which were reasonably agreed to by the Grantor. The Grantee represents that it is a knowledgeable, experienced and sophisticated buyer and developer of real estate, and that it is relying solely on its own expertise and that of its professionals in purchasing the Property. As of the date hereof, the Grantee assumes the risk that adverse matters, including, but not limited to, adverse physical, geotechnical and environmental conditions, may not have been revealed by the Grantee's Inspections.
- (d) No Other Statements. The Grantee further acknowledges and agrees that there are no oral agreements, warranties or representations, collateral to or affecting the Property, by the Grantor, any agent of the Grantor or any third party. The Grantor is not liable or bound in any manner by any oral or written statements, representations or information pertaining to the Property furnished by any of the Seller Parties, any real estate broker or agent or any other person, unless the same are specifically set forth or referred to in the Agreement. The Grantee acknowledges that the Purchase Price reflects the "as is, where is" nature of this sale and any faults, liabilities, defects or other adverse matters that may be associated with the Property. The Grantee, with the Grantee's counsel, has fully reviewed the disclaimers

and waivers set forth in this Deed and in the Agreement, and understands the significance and effect thereof. The Grantee acknowledges and agrees that the disclaimers, waivers, assumptions, indemnifications and other agreements set forth in this Deed and in the Agreement are an integral part of this Deed and the Agreement and are fair and reasonable, and that the Grantor would not have agreed to sell the Property to the Grantee for the Purchase Price if such disclaimers, waivers, assumptions, indemnifications and other agreements were not set forth in this Deed and the Agreement.

Release. The Grantee and the Buyer Parties hereby fully release the Seller Parties from (i) any and all claims, costs, losses, liabilities, damages, expenses, demands or causes of action now or hereafter arising from or related to any matter of any kind or nature relating to the Property, and (ii) any and all responsibility and liability to the Grantee or the Buyer Parties, or any person or entity claiming by, through or under the Grantee or the Buyer Parties, regarding the condition (including the presence in the soil, air, structures, and surface and subsurface waters of hazardous substances or substances that have been or may in the future be determined to be toxic, hazardous, undesirable or subject to regulation and that may need to be specially treated, handled and/or removed from the Property under current or future federal, state and local laws, regulations, or guidelines, and natural resource damage), valuation, salability or utility of the Property, or its suitability for any purpose whatsoever. Without limiting the generality of the foregoing, the Grantee and the Buyer Parties hereby agree not to institute, prosecute, facilitate or (absent a court order or other binding court process) assist in the institution or prosecution of any action, claim, proceeding or suit against any of the Seller Parties, directly or indirectly, arising from or out of, or in connection with, any claim relating to any environmental conditions on, at, under or from the Property, whether such environmental conditions existed or occurred prior to or after the date hereof and regardless of whether such conditions were caused by the acts or omissions of the Seller Parties or by third parties; provided, nothing in this subparagraph 4(e) shall be deemed or construed as prohibiting or limiting in any way the right of the Grantee or any Buyer Party to defend itself against a third party in connection with any action, claim, proceeding or suit which is instituted and/or prosecuted against the Grantee or any Buyer Party by a third party.

### (f) Assumption and Indemnification.

(i) (A) Subject to subparagraph 4(f)(i)(B) below, the Grantee and the each Buyer Party that at any time owns, occupies, operates on or uses any portion of the Property, as applicable, shall, and hereby do, (1) assume responsibility and liability for any and all matters (including environmental matters but excluding the Excluded Claims) relating to the Property, including without limitation the responsibility and liability for compliance with the DER, the NFA and the ACO, and (2) indemnify, defend and hold the Seller Parties free and harmless from and against any and all claims, costs (including, without limitation, reasonable counsel fees, fees of experts and costs of suit), losses, liabilities, damages, expenses, demands or causes of action now or hereafter arising from or related to any matter of any kind or nature relating to the Property, including without limitation matters arising or resulting from the negligence or fault of any of the Seller Parties, but excluding the Excluded Claims.

(B) It is understood and agreed that the provisions of subparagraph 4(f)(i)(A) above, including the assumption and indemnification provisions thereof, (1) shall apply to and be binding upon the Grantee and each Buyer Party that at any time owns, occupies, operates on or uses any portion of the Property (other than the unrelated future grantees of the Property identified in clause (2) below) only with respect to matters that occurred or accrued prior to the date hereof or that occur or accrue at any time after the date hereof during which the Grantee or any such other Buyer Party owns, occupies, operates on or uses any portion of the Property and (2) shall apply to and be binding upon each future grantee of all or any portion of the Property (other than the Grantee and its parents, subsidiaries, Affiliates, employees, officers, directors, principals, attorneys, representatives and agents, and their respective heirs, successors and assigns) only with respect to matters that occur or accrue at any time after

the date hereof during which such unrelated future grantee owns, occupies, operates on or uses any portion of the Property (and each such Buyer Party, including each unrelated future grantee shall be deemed to have assumed such obligations by virtue of the inclusion of such obligations in this Deed).

(ii) In the event that the Grantee or any Buyer Party that at any time owns, occupies, operates on or uses any portion of the Property fails to comply with the requirements of the DER, the NFA or the ACO following the date hereof, the Grantee and the Buyer Parties hereby grant to the Grantor, the Seller Parties, the Grantor's agents, employees, contractors, subcontractors and consultants and the NJDEP access to the Property for the purpose of performing any or all activities necessary to comply with or satisfy the terms of the DER, the NFA or the ACO. Nothing in this clause (ii), however, shall be deemed or construed as an agreement by the Grantor or any Seller Party to comply with or satisfy any of the requirements of the DER, the NFA or the ACO or as an obligation on the part of any Seller Party to perform any activities in connection therewith. The provisions of this clause (ii) are incorporated into the Access Agreement dated the date hereof between the Grantor and the Grantee which is about to be recorded with the Clerk of Middlesex County, New Jersey immediately after the recordation of this Deed.

(iii) (A) (1) Promptly after either party becomes aware of any Indemnified Event, such party shall notify the other party of same in writing. Either party's failure to provide or delay in providing such notice to the other party shall not relieve or release any Buyer Party from any of its indemnification obligations hereunder, unless, and then only to the extent that, the Buyer Party had no knowledge of such Indemnified Event and the Grantee proves that the Grantor's failure to provide or delay in providing such notice to the Buyer Party materially prejudiced the Buyer Party's ability to defend against an Indemnified Claim that relates to or arises out of such Indemnified Event.

(2) In addition, promptly after receipt by any Seller Party of written notice of an Indemnified Claim, such Seller Party shall provide written notice thereof to the applicable Buyer Party. The Seller Party's failure to provide or delay in providing such notice to the Buyer Party shall not relieve or release the Buyer Party from any of its indemnification obligations hereunder unless, and then only to the extent that, the Buyer Party had no knowledge of the Indemnified Claim and the Buyer Party proves that the Seller Party's failure to provide or delay in providing such notice to the Buyer Party materially prejudiced the Buyer Party's ability to defend against the Indemnified Claim.

(B) Until such Indemnified Claim has been irrevocably paid and satisfied in full, the applicable Buyer Party shall, at the Buyer Party's cost, resist or defend each Indemnified Claim (in the name of the Seller Party, if necessary) by competent counsel selected by the Buyer Party and reasonably acceptable to the Seller Party (which may include, subject to the Seller Party's reasonable approval, the attorneys for the Buyer Party's insurance carrier, if the Indemnified Claim is covered by insurance). The Buyer Party and/or the Buyer Party's insurance carrier shall control all decisions in respect of the prosecution and/or settlement of the Indemnified Claim. The Seller Party shall have the right, at its own cost, to participate in (but not control) the prosecution and/or settlement of the Indemnified Claim, whether by itself or through attorneys of the Seller Party's choice.

(C) Subject to subparagraph 4(f)(iii)(E) below, the indemnification obligations of a Buyer Party hereunder shall not apply to the extent that (1) any Seller Party agrees to a settlement of an Indemnified Claim without the consent of the Buyer Party thereto and (2) any Seller Party retains its own attorneys in connection with an Indemnified Claim and the Buyer Party proves that such retention will materially impair or diminish the Buyer Party's insurance coverage with respect to such Indemnified Claim.

- (D) (1) The parties shall, at the applicable Buyer Parties' expense, use commercially reasonable efforts to resort to coverage under the Pollution Legal Liability Policy with respect to any Indemnified Claim to the extent that the Pollution Legal Liability Policy is applicable thereto. Except as set forth in clause (2) below, a Buyer Party 's obligation to indemnify the Grantor and/or the Seller Parties with respect to any such Indemnified Claim shall be subject to the exhaustion of remedies by the Buyer Party under the Pollution Legal Liability Policy. To the extent that any deductible is payable under the Pollution Legal Liability Policy in connection with any Indemnified Claim, the Buyer Party shall be solely responsible for the payment of same, and neither the Grantor nor any of the Seller Parties shall be liable for any portion thereof.
- (2) Notwithstanding anything to the contrary contained in clause (1) above, the Grantee's obligation to indemnify the Grantor and/or the Seller Parties with respect to any Indemnified Claim shall not be subject to the exhaustion of remedies under the Pollution Legal Liability Policy, and the Grantee shall immediately indemnify the Grantor and/or the Seller Parties as provided herein with respect to any such Indemnified Claim, in the event that:
- (a) the Grantor and/or any Seller Party become obligated to pay any amount or incur any liability to any private or governmental person or entity with respect to such Indemnified Claim, whether by reason of the entry of a judgment or order, the imposition of a governmental directive or otherwise; or
- (b) the failure to pay such Indemnified Claim would subject the Grantor and/or any Seller Party to any civil or criminal fine, penalty or other liability.
- (E) Notwithstanding anything to the contrary contained herein, in the event that the Grantee or any Buyer Party, as applicable, defaults in the performance of any of its obligations under this subparagraph 4(f) and such default continues uncured for five (5) days (with respect to any default that can be cured by the payment of money) after notice thereof from the Grantor or any Seller Party or fifteen (15) days (with respect to any other default) after notice thereof from the Grantor or any Seller Party, the Grantor and/or any Seller Party, as applicable, shall have the right, but not the obligation, to take immediate control of the defense of the Indemnified Claim, including without limitation the right to prosecute, settle or otherwise deal with the Indemnified Claim with counsel of its own choice and in any manner it deems appropriate in its sole and absolute discretion. All costs incurred by the Grantor and/or the Seller Parties in connection therewith, including without limitation the amount of the Indemnified Claim or the amount of the settlement thereof and any and all legal fees and expenses incurred in connection therewith, shall be deemed to be part of the indemnification obligations of the Grantee and/or the Buyer Parties under this subparagraph 4(f) and shall immediately be paid by the Grantee and/or the Buyer Parties to the Grantor and/or the Seller Parties, as applicable, upon demand.
- (g) Waivers and Assumption. The Grantee and the Buyer Parties hereby waive any and all objections to or complaints (including, but not limited to, actions based on federal, state or common law and any private right of action under any other state and federal law to which the Property is or may be subject) against the Grantor or the Seller Parties regarding physical characteristics and existing conditions, including, without limitation, structural and geologic conditions, subsurface soil and water conditions and solid and hazardous waste and hazardous substances on, under, adjacent to or otherwise affecting the Property. The Grantee and the Buyer Parties hereby further assume the risk of changes in applicable laws and regulations relating to past, present and future environmental conditions on the Property, and the risk that adverse physical characteristics and conditions, including, without limitation, the presence of hazardous substances or other contaminants, may not be revealed by its Inspections.

- (h) Security for Grantee's Obligations. As security for the obligations of the Grantee and the Buyer Parties under this Paragraph 4 (including without limitation the assumption and indemnification obligations of the Grantee and the Buyer Parties in clauses (f) and (g) above), the Grantee has delivered to the Grantor concurrently herewith the Pollution Legal Liability Policy. The Grantee shall, at its own cost and expense, maintain the Pollution Legal Liability Policy in full force and effect for at least ten (10) years after the date hereof, and shall provide reasonable evidence of same to the Grantor on a regular basis. The Grantee further agrees that following Closing and during development activities on the Property, the Grantee will use reasonable commercial efforts to require its excavation and fill contractors to procure and maintain Contractor's Pollution Liability (CPL) coverage, naming the Grantor and the Seller Parties as additional insureds, with limits in the amount of \$3,000,000.00 or greater. The Grantee shall keep the Grantor reasonably informed of such efforts and shall supply the Grantor certificate(s) of insurance attesting to such CPL coverage when procured.
- (i) <u>Natural Resource Damage Claims</u>. In no event shall the Grantee, the Buyer Parties or their respective successors and assigns be liable for Natural Resource damage claims and other similar claims asserted by the NJDEP or any other governmental authority or agency resulting from the acts of the Grantor or the Seller Parties and relating to conditions prior to the date hereof.
- (j) Run with the Land. The provisions of this Paragraph 4 shall survive the Closing of title to the Property and the recordation of this Deed, and are incorporated into this Deed as a servitude that runs with the land and is binding upon the Grantee and the Buyer Parties and their respective successors and assigns, including all future grantees of the Property, all of which are deemed to have accepted and agreed to be bound by the terms hereof. Upon each sale of all or any portion of the Property, the Grantee and/or each Buyer Party, as applicable, shall deliver written notice of such sale (including the full name and notice address of the person or entity that is acquiring title to all or any portion of the Property) to the Grantor at the Grantor's address set forth on the first page of this Deed by registered or certified mail, postage prepaid, return receipt requested, or by overnight delivery service or by personal delivery, which requirement shall likewise run with the land.

### (i) Certain Defined Terms. As used in this Paragraph 4:

- (i) "ACO" means, collectively, the Administrative Consent Order dated September 5, 1990 between the New Jersey Department of Environmental Protection and American Cyanamid Company, recorded on November 5, 1990 in Book 4114, Page 25, as amended by an Amendment thereto dated July 6, 1993, which was recorded in Book 4114, Page 53, to the extent that same relates to or affects the Property.
- (ii) "Buyer Parties" means, collectively, the Grantee, its parents, subsidiaries, Affiliates, employees, officers, directors, principals, attorneys, representatives and agents, and their respective heirs, successors and assigns, including without limitation all future grantees of the Property.
- (iii) "DER" means the Declaration of Environmental Restrictions dated April 26, 1995 and recorded on May 4, 1995 in Book 4236, Page 348.

### (iv) "Excluded Claims" means:

(A) with respect to any private, non-governmental party (other than the Buyer Parties), claims with respect to any matter that occurred or accrued during the period of time that the Seller Parties owned, occupied, operated or used the Property, but only to the extent that no act or omission of any of the Buyer Parties has contributed thereto;

- (B) claims with respect to any criminal activities or fraud on the part of the Seller Parties;
- (C) claims or penalties based upon a failure by the Seller Parties to comply with the NFA, the DER and/or the ACO that occurred or accrued during the period of time that the Seller Parties owned, occupied, operated or used the Property; and
- (D) Natural Resource damage claims and other similar claims asserted by the NJDEP or any other governmental authority or agency resulting from the acts of the Grantor or the Seller Parties and relating to conditions prior to the date hereof.
- (v) "Indemnified Claim" means a claim, action or proceeding against the Grantor or any other Seller Party with respect to any matter that is covered by or subject to the indemnification provisions set forth in subparagraph 4(f) hereof.
- (vi) "Indemnified Event" means a matter, event or occurrence at or with respect to the Property which could reasonably be expected to give rise to an Indemnified Claim.
- (vii) "NFA" means the No Further Action Letter and Covenant Not to Sue with respect to the Property issued by the New Jersey Department of Environmental Protection on September 24, 2002.
- (viii) "Pollution Legal Liability Policy" means a pollution legal liability policy, obtained and maintained by the Grantee at the Grantee's sole cost and expense, which complies with the requirements therefor set forth in the Agreement.
- (ix) "Seller Parties" means, collectively, the Grantor, Cytec Industries Inc., Wyeth Holdings Corporation (f/k/a American Cyanamid Company) and, with respect to each of the foregoing, their parents, subsidiaries, Affiliates, employees, officers, directors, principals, attorneys, representatives and agents, and their respective heirs, successors and assigns.
- 5. NOTICE REQUIRED BY ACO. PURSUANT TO PARAGRAPH 92(c) OF THE ACO, NOTICE IS HEREBY GIVEN THAT (i) THE PROPERTY IS THE SUBJECT OF THE ACO, AND (ii) THIS DEED IS SUBJECT TO THE REQUIREMENTS SET FORTH IN PARAGRAPH 93 OF THE ACO REGARDING THE USE OF THE PROPERTY AND DEED RESTRICTIONS. The Grantee hereby assumes all of the Grantor's obligations under the ACO, and agrees to provide access to the Property to the New Jersey Department of Environmental Protection as required by the ACO.
- 6. <u>Covenant As To Grantor's Acts</u>. The Grantor hereby covenants that, except as set forth in this Deed or in the Agreement, the Grantor has done no act to encumber the Property.

[Signatures on next page]

IN WITNESS WHEREOF, the Grantor has signed this Deed as of the date set forth above.

CARTERET DEVELOPMENT LLC

Name: Thomas P. Wozniak

Title: Treasurer

The Grantee hereby consents to, accepts and agrees to be bound by all of the terms, provisions and conditions set forth in this Deed:

RAHWAY ARCH PROPERTIES, L.L.C.

By: Name: Christer Pucilio

Title: Manager

STATE OF NE	50 k.fr (10) (40) (40) (40) (40) (40) (40)						
COUNTY OF	PASSAIC )ss.:						
I certify that on January 14 , 2010, THOMA'S P. WOZNIAK personally came before me and acknowledged, under oath, to my satisfaction, that:							
(a)	this person is the TREASUREL of CARTERET DEVELOPMENT LLC, the limited liability company named in the attached document;						
(b)	this person executed and delivered the attached document on behalf of and as the voluntary act and deed of the company; and						
(c)	this person was authorized by the company to execute and deliver the attached document on behalf of the company.						
	Notary public  BERNADETA BAK  NOTARY PUBLIC OF NEW JERSEY  NY COMMISSION EXPRES SEPT. 24, 2013						
STATE OF NE	W JERSEY ) )ss.:						
COUNTY OF							
I certify that on January 15, 2010, Chocker Poetlo personally came before me and acknowledged, under oath, to my satisfaction, that:							
(a)	this person is the Manager of RAHWAY ARCH PROPERTIES, L.L.C., the limited liability company named in the attached document;						
(b)	this person executed and delivered the attached document on behalf of and as the voluntary act and deed of the company; and						
(c)	this person was authorized by the company to execute and deliver the attached document on behalf of the company.						

LOUIS 1. KARP, ESQ.
ATTORNEY AT LAW
IN THE STATE OF NEW JERSEY

Notary public

#### SCHEDULE A

#### LEGAL DESCRIPTION

All those certain lots, tracts or parcels of land and premises, hereinafter particularly described, situate, lying and being in the Borough of Carteret, County of Middlesex and State of New Jersey:

TRACT I

FIRST PARCEL: BEGINNING at a large stone 4437.73 feet measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad also known as Carteret Extension Railroad distant in said center line on a course of South 49 degrees 26 minutes 10 seconds East 815.61 feet from a stone monument located at the point of intersection of said center line of said Sound Shore Extension Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East and measuring 2438.1 feet from another stone monument located at the beginning of said course and distance and situated in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey: thence running (1) North 79 degrees 3 minutes East 390 feet to average high water line of the Rahway river on the westerly side of said Rahway River; thence (2) along the average line of high water of the Rahway River South 4 degrees 25 minutes East 191.05 feet; thence (3) continuing along the same South 5 degrees 6 minutes West 753.68 feet; thence (4) still continuing along the same South 27 degrees 47 minutes West 44.4 feet to the average high water line of the northerly side of Deep Creek; thence (5) along the same south 57 degrees 7 minutes West 64 feat to the center of Oyster Creek; thence (6) along the center of Oyster Creek, North 78 degrees 49 minutes West 126 feat; thence (7) Oyster Creek, North 78 degrees 49 minutes West 126 feet; thence (7) still continuing along the same South 78 degrees 57 minutes West 208 feet to the center of a small ditch; thence (8) along the center of said small ditch North 58 degrees 56 minutes West 12 feet; thence (9) continuing along the same North 86 degrees 21 minutes West 29 feet; thence (10) still continuing along the same North 63 degrees West 112 feet; thence (11) still continuing along the same North 26 degrees 40 minutes West J9.75 feet; thence (12) still continuing along the same North 35 degrees 3 minutes West J5.9 feet; thence (13) still continuing along the same North 6 degrees 36 minutes East 24.5 feet; thence (14) still continuing along the same North 3 degrees 55 minutes East 33.51 feet; thence (15) North 18 degrees 51 minutes East 808 feet to the place of (15) North 18 degrees 51 minutes East 808 feet to the place of BEGINNING.

Containing within the lines as hereinabove described

measured on a course of North 40 dagress 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 365.22 feet from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection in said center line of said Railroad, which said point of intersection in said center line of said Railroad is situated in a line bearing South 47 degrees 51 minutes 30 seconds East 2438.1 feet from another stone monument located at the beginning of said course and distance and being in the center line of Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey and which beginning point is in the average high water line of the easterly side of the Rahway River at the middle of a small ditch; thence running (1) along said average high water line of said Rahway River North 30 degrees 31 minutes East 105 feet; thence (2) continuing along the same North 10 degrees 58 minutes 20 seconds East 423.45 feet; thence (3) south 40 degrees 54 minutes East 686 feet to a large stone; thence (4) south 18 degrees 51 minutes West 677.16 feet; thence (5) North 28 degrees 51 minutes West 748.72 feet to the place of BEGINNING.

Containing within the lines as hereinabove described

Containing within the lines as hereinabove described 7.526 acres.

THIRD PARCEL: BEGINNING at a large stone 4437.73 feet measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 815.61 feet from a stone monument located at the point of intersection in said center line of said Railroad which said point of intersection in said center line of said Railroad is situated in a line bearing South 47 degrees 51 minutes 30 seconds Bast 2438.1 feet from another stone monument located at the beginning point of said course and distance and being in the cantar line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) North 79 degrees 3 minutes East 390 feet to the average high water line of the westerly side of the Rahway River; thence (2) North 15 degrees 4 minutes 30 seconds West 165.48 feet; thence (3) North 22 degrees 5 minutes West 240 feet; thence (4) North 44 degrees 25 minutes West 247.2 feet; thence (5) North 55 degrees 29 minutes West 133.6 feet; thence (6) North 80 degrees 52 minutes 30 seconds West 149.65 fest; thence (7) South 81 degrees 7 minutes 50 seconds West 126.7 feet; thence (8) South 51 degrees 49 minutes 30 seconds West 121.65 feet; thence (9) South 20 degrees 45 minutes West 124.45 feet; thence (10) South 40 degrees 34 minutes East 686 feet to the place of BEGINNING.

The second, third, fourth, fifth, sixth, seventh, eighth and minth courses, run along the average high water line of Rahway River.

Containing within the lines as hereinabove described 8.319 acres.

POURTH PARCEL: BEGINNING at a point 1631.02 feet measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carterat Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds Bast 591.07 feet from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East 2438.1 feet from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy division of the Central Railroad Company of New Jersey; thence running (1) North 35 degrees 52 minutes West 262 feet; thence (2) North 71 degrees 15 minutes 30 seconds East and crossing Cross Creek 364 feet to the northerly side thereof; thence (3) south 72 degrees East 1.83 feet; thence (4) south 59 degrees East 28 feet; thence (5) South 77 degrees East 16 feet; thence (6) South 32 degrees East 28 feet; thence (7) North 85 degrees East 31 feet; thence (8) South 64 degrees East 16 feet; thence (9) South 86 degrees East 13 feet; thence (10) North 35 degrees East 16 feet to the middle of a branch of cross Creek; thence (11) South 40 degrees East 16.5 feet; thence (12) South 29 degrees East 18 feet; thence (13) South 16 degrees East 15 feet; thence (14) South 35 degrees East 16 feet; thence (15) South 8 degrees East 25 feet; thence (16) South 26 degrees East 32 feet; thence (17) South 36 degrees West 36 feet; thence (18) South 12 degrees East 50 feet; thence (19) South 20 degrees East 50 feet; thence (20) South 28 degrees East 50 feet; (21) South 33 degrees 22 minutes East 53.32 feet; thence (22) North 86 degrees 11 minutes 30 seconds West 425 feet to the place of BEGINNING.

The third, fourth, fifth, sixth, seventh, eighth, ninth and tenth courses run along the northerly side of Cross Creek. The eleventh to the twenty-first courses both inclusive run through the middle of a branch of Cross Creek and the indications of the same. Containing within the lines as described 3.036 acres.

FIFTH PARCEL: BEGINNING at a point fixed by a stone marked T.B. 2590.44 feet measured on a course of North 40 degrees 13 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 990.39 feet from a stone

monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East 2438.1 feet from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy branch of the Central Railroad Company of New Jersey; thence running (1) North 72 degrees 40 minutes 20 seconds East 389.58 feet; thence (2) North 68 degrees 40 minutes 30 seconds East 368.28 feet; thence (3) North 19 degrees 26 minutes 30 seconds West 162.22 feet; thence (4) running through the center of a fork of Oyster Creek North 22 degrees West 34 feet; thence (5) continuing along the same North 46 degrees 14 minutes East 21.2 feet; thence (6) continuing along the same North 29 degrees 54 minutes East 13.87 feet to the center of the main part of Oyster Creek; thence (7) South 77 degrees 19 minutes 40 seconds West 686.26 feet; thence (8) South 2 minutes East 314.16 feet to the place of BEGINNING.

Containing within the lines as described 4.31 acres.

SIXTH PARCEL: BEGINNING at a point 2817.72 feet measured on a course of North 40 degrees 33 minutes 30 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad distant in said center line on a course of South 49 degrees 26 minutes 10 seconds East 2695.24 feet from a stone monument located at the point of intersection of said center line of said Sound Shore Extension Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East and measuring 2438.1 feet from another stone monument located at the beginning of said course and another stone monument located at the beginning of said course and distance and situated in the center line of the Elizabethport and Perth Amboy branch of the Central Railroad Company of New Jersey the beginning point first above mentioned being on the northeasterly side of Deep Creek where the same is intersected by northeasterly line of the premises adjoining the premises hereby described on the southeast; thence running (1) along the division line of lands herein described and lands adjoining the same on the southeast North 51 degrees 35 minutes 20 seconds East 515.7 feet to the average high water line of the Southwasterly side same on the southeast North 51 degrees 35 minutes 20 seconds East 515.7 feet to the average high water line of the Southwesterly side of the Rahway River; thence (2) along the same North 33 degrees 45 minutes West 193.68 feet; thence (3) continuing along the same North 27 degrees West 274.18 feet; thence (4) still continuing along the same North 20 degrees 32 minutes West 254 feet; thence (5) still continuing along the same North 16 degrees 25 minutes West 279.25 feet; thence (6) still continuing along the same North 12 degrees 12 minutes West 218.6 feet; thence (7) still along the same North 35 degrees 34 minutes West 21.7 feet to the intersection of the average high water line of the Rahway River aforesaid and the average high water line of the southerly side of Deep Creek; thence (8) along the average high water line of the southerly side of Deep Creek south 64 degrees 7 minutes West 219.88 feet; thence (9) continuing along the same South 39 degrees 56 minutes West 204.7 feet; thence (10) still continuing along the same South 24 degrees 33 minutes West 103.25 feet to the northeasterly side of Deep Creek; thence (11) continuing along the same South 5 degrees 25 minutes West 411.7 feet; thence (12) still continuing along the same South 28 degrees 22 minutes East 188.3 feet; thence (13) still continuing along the same South 40 dagrees 4 minutes East 119.4 feet; thence (14) still continuing along the same South 49 degrees 28 minutes East 138.6 feet; thence (15) still continuing along the same South 19 degrees 50 minutes East 153 feet; thence (16) still continuing along the same South 34 degrees 16 minutes 10 seconds East 167.78 feet; thence (17) still continuing along the same South 32 degrees Bast 90 feet to the place of BEGINNING. containing within the lines as hereinabove described

15.225 acres.

SEVENTH PARCEL: BEGINNING at a stake or stone planted on the southerly side of Rahway River in the northwest corner of a tract of salt meadow formerly belonging to Hugh Marsh, later in the possession of James Hunt and now belonging to American Cyanamid Company; thence running along the westerly line of said lands of said American Cyanamid Company south 2 chains and 40 links to a stake or stone in said line; thence North 80° 45 minutes West 8 chains and 94 links to a stake or stone; thence North 2 chains 80 links to said river; thence easterly down said river to the place of BEGINNING.

Containing 2% acres more or less.

Being the same premises conveyed to the Grantor herein from Henry C. Little and Bruce L. Little, his wife, by deed dated June 28, 1944 and recorded in the Middlesex County Clerk's Office in Deed Book 1263 on Page 301 on August 1, 1944.

#### TRACT II

BEGINNING at a point 2828.98 feet measured on a course of north 40 degrees 33 minutes 50 seconds east from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of south 49 degrees 26 minutes 10 seconds east 785.96 feet from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated in a line bearing south 47 degrees 51 minutes 30 seconds east and measuring 2438.1 feet from another stone monument located at the beginning of said course and distance and situated in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) north no degrees 2 minutes west 771.99 feet to the average high water line of the Rahway River; thence (2) north 71 degrees 14 minutes east along said average high water line of the Rahway River 257.10 feet; thence (3) continuing along said average high water line of the Rahway River north 42 degrees 3 minutes east 103 feet; thence (4) still along said average high water line of the Rahway River north 32 degrees 58 minutes east 154.60 feet; thence (5) still along said average high water line of the Rahway River north 30 degrees 31 minutes east 182.17 feet; thence (6) south 28 degrees 51 minutes east 748.72 feet; thence (7) south 18 degrees 51 minutes west 130.84 feet; thence (8) south 3 degrees 55 minutes west 33.51 feet; thence (9) south 6 degrees 36 minutes west 24.50 feet; thence (10) south 51 degrees 26 minutes 20 seconds west 446.82 feet; thence (11) south 77 degrees 19 minutes 40 seconds west 464.44 feet to the place of BEGINNING.

Being the same premises conveyed to the Grantor herein by Final Judgment dated January 13, 1948 and recorded in the Middlesex County Clerk's Office in Deed Book 1377 on Page 151 on January 28, 1948.

#### TRACT III

FIRST PARCEL: BEGINNING at a point 2338 feet and 91 hundredths of a foot measured on a course of north 40 degrees 33 minutes 50 seconds east from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad distant in said center line of said Railroad on a course of south 49 degrees 26 minutes 10 seconds east 2428 feet and 2 tenths of a foot from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing south 47 degrees 51 minutes 30 seconds east 2438 feet and one tenth of a foot from another stone monument located at the beginning of said course and distance and being in the center line of the Blizabeth Port and Porth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) north 48 degrees 36 minutes 20 seconds East 519 feet and 5 hundredths of a foot to the southwesterly side of Deep Creek; (2) south 37 degrees 38 minutes east 99 feet and 12 hundredths of a foot; thence (3) south J2 degrees east 100 feet; thence (4) south 29 degrees east 90 feet; thence (5) south 21 degrees east 25 feet; thence (6) south 6 degrees east 18 feet; thence (7) south 14 degrees west 44 feet; thence (8) south 24 degrees west 78 feet; thence (9) south 43 degrees west 145 feet;

thence (10) south 39 degrees west 46 feet; thence (11) south 33 degrees west 72 feet; thence (12) south 44 degrees west 37 feet; thence (13) north 47 degrees 40 minutes west 53 feet and 28 hundredths of a foot; thence (14) north 61 degrees 10 minutes west 69 feet and 48 hundredths of a foot; thence (15) north 65 degrees 10 minutes west 57 feet and 5 tenths of a foot; thence (16) north 55 degrees west 25 feet; thence (17) north 38 degrees west 19 feet; thence (18) north 30 degrees west 14 feet; thence (19) north 37 degrees 30 minutes west 75 feet; thence (20) north 25 degrees west 25 feet; thence (21) north 41 degrees 30 minutes west 50 feet; thence (22) north 55 degrees 40 minutes west 50 feet to the place of BEGINNING.

The second course to the 12th course, both inclusive, in the foregoing description, run along the southwesterly and

northwesterly sides of Deep Creek.

The 13th course to the 22nd course, both inclusive, run along the northeasterly side of Ned's Creek. Containing within the lines as hereinbefore described 4.266 acres.

SECOND PARCEL: BEGINNING at a point 2590.44 feet measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of South Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 990.39 feet from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East 2438.10 feet from another stone monument located at the beginning of said course and distance and being in the centerline of the Elizabethport and Perth Amboy Branch of the Central Railroad Company; thence running (1) North 72 degrees 7 minutes 20 seconds East 389.58 feet; thence (2) South 21 degrees 56 minutes East 250.80 feet; thence (3) South 72 degrees 37 minutes 20 seconds West 392.14 feet; thence (4) North 21 degrees 24 minutes West and running through a line ditch 247.22 feet to the place of BEGINNING.

THIRD PARCEL: BEGINNING at a point 2208.99 feet measured on a course of North 40 degrees 33 minutes 50 seconds Bast from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 756.11 feet from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East 2438.1 feet from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) north 72 degrees 7 minutes 20 seconds East 447.66 feet; thence (2) South 21 degrees 24 minutes East and running through a line ditch 247.22 feet; thence (3) South 72 degrees 37 minutes 20 seconds West 560.56 feet; thence (4) North 4 degrees 7 minutes East 260.84 feet to the place of BEGINNING.

FOURTH PARCEL: BEGINNING at a point 1814.70 feet measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 1051.91 feet from a stone monument located at the point of intersection in said center line of said Railroad which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East 2438.1 feet from another stone monument located at the beginning of said course and being in the center line of the Elizabethport and Parth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) North 2 degrees 28 minutes 20 seconds East 128.65 feet; thence (2) North 4 degrees 7 minutes East 103.45 feet; thence (3) North 72 degrees 37 minutes East and running through a line ditch 206.5 feet; thence (5) South 72 degrees West 1050.76 feet to the place of BEGINNING.

PIPTH PARCEL: BEGINNING at a point 2590.44 feet measured on a course of North 40 degrees 33 minutes 50 seconds east from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad, on a course of south 49 degrees 26 minutes 10 seconds east 990.39 feet from a stone monument located at the point of intersection in said center line of said Railroad which said point of intersection is situated in a line boaring south 47 degrees 51 minutes 30 seconds east 2438.1 feet from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company; thence running (1) south 72 degrees 7 minutes 20 seconds west 447.66 feet; thence (2) North 4 degrees 7 minutes east 64.71 feet; thence (3) north 5 degrees 41 minutes 10 seconds east 504.64 feet; thence (4) north 76 degrees 58 minutes east 360.88 feet; thence (5) north 2 minutes east 515:15 feet to the place of BEGINNING.

SIXTH PARCEL:

First Subparcel: Beginning at a stake standing in the line of Isaac Stansbury's, formerly Peter Raynor's meadow; thence (1) along said line north seventy-four degrees east four chains and twenty links to a stake; thence (2) north three degrees west eight chains and ninety-two links to the Rahway River; thence (3) along said River four chains and eight links to a stake; thence (4) on a straight line to the place of beginning. Bounded by meadow formerly belonging to a Peter Raynor, now Isaac Stansbury on the southeast; on the northeast by meadow formerly of Freeman Morris; northwesterly by said River and southwesterly by meadows more or less.

Second Subparcel: Beginning at a stake standing in the side of a small creek; thence (1) south by east four chains and twenty-seven links to a stake; thence (2) east by north five chains to a stake standing in the corner of meadow belonging to the estate of Freeman Force, deceased; thence (3) north by west three chains and seventy eight links along said Freeman Force line to a stake standing in the line of meadow formerly of Job Thorp; thence (4) west by south in a straight line to beginning; containing two acres more or less.

SEVENTH PARCEL:

Pirst Subparce): AEGINNING at a stone planted by the side of Rahway River; thence running south and by west part of meadow formerly belonging to Force and part by meadow now or formerly of Milliam Lee 10 chains to a stake being a corner of lands now or formerly of Richard Rights; thence along said Rights line and binding thereon south eighty-seven (87) degrees forty-five (45) minutes west 5.01 chains to a stone; being another corner of said Rights' meadow and stands in the line of land now or formerly of Moses Jaquish; thence along said Jacquish's and line of meadow formerly belonging to Morris D'Camp now or formerly belonging to Thomas Marsh, Jr., and binding thereon north and ten (10) minutes west 10.58 chains to a stone by the river and on the south side of the same; thence down said Rahway River and binding thereon to the beginning corner.

beginning corner.
Bounded southwesterly partly by a meadow now or formerly
of Samuel Force and partly by meadow now or formerly of William
Lee: westerly by meadow or formerly of Richard Rights;
northwesterly by premises now or formerly of Moses Jaquish and
Thomas Marsh, Jr., easterly by Rahway River, and containing four
and nine-tenths (4.9) acres be the same more or less.

Second Subparcel: That certain tract of salt meadow adjoining the tract deeded in Book 621, Page 32, on the south, containing approximately two (2) acres, bounded on the west by lands formerly belonging to Moses Jaquish and later belonging to Thomas Marsh, Jr.; on the south by lands now or formerly belonging to Avery; on the east by lands formerly belonging to William Les and on the north by the above described tract.

BEGINNING at a point 2152.87 feet EIGHTH PARCEL: measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees 26 minutes 10 seconds East 98.29 feet from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East 2438.10 feet from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence South 38 running (1). South 6 degrees East 38.87 feet; thence (2) degrees East 14 feet; thence (3) South 3 degrees West 60 feet; thence (4) South 8 degrees East 22 feet; thence (5) South 16 degrees East 48 feet; thence (6) South 19 degrees East 57, feet; thence (7) South 28 degrees East 78 feet; thence (8) South .50 degrees East 25 feet; thance (9) South 37 degrees East 25 feet; thence (10) South 53 degrees East 25 feet; thence (11) South 64 degrees East 45 feet; thence (12) South 72 degrees East 55 feet; thence (13) South 59 degrees East 25 feet; thence (14) South 77 degrees East 16 feet; thence (15) South 32 degrees East 28 feet; thence (16) North 85 degrees East 31 feet; thence (17) South 64 degrees East 16 feet; thence (18) South 86 degrees East 13 feet; thence (19) North 35 degrees East 16 feet; thence (20) South 40 degrees East 2.50 feet; thence (21) North 8 degrees East 8 feet; thence (22) North 20 degrees West 6 feet; thence (23) North 31 degrees East 25 feet; thence (24) North 12 degrees East 10 feet; thence (25) North 56 degrees East 13 feet; thence (26) North 37 degrees East 15 feet; thence (27) North 66 degrees East 13 feet; degrees East 15 feet; thence (27) North 66 degrees East 13 feet; thence (28) North 30 degrees East 31.17 feet; thence (29) North 12 degrees East 37.40 feet; thence (30) South 3 degrees 23 minutes West; 69.30 feet; thence (31) North 72 degrees 22 minutes East 130.68 feet; thence (32) North 5 degrees 41 minutes 10 seconds East 317.50 feet; thence (33) North 88 degrees 47 minutes 10 seconds West 134.84 feet; thence (34) North 89 degrees 45 minutes 50 seconds West 437.53 feet to the place of BEGINNING.

The 1st course to the 19th course, both inclusive, run along the easterly side of Cross Creek. The 20th course runs from said side of Cross Creek to the center of the same. The 21st course to the 29th course, both inclusive, run through the center of Cross Creek.

of Cross Creek.

Being the same premises convayed to the Grantor herein from Kenry C. Little and Bruce L. Little, his wife, by deed dated July 24, 1964 and recorded in the Middlesex County Clerk's Office in Deed Book 2467 on Page 1126 on August 5, 1964.

TRACT IV ALL that certain tract of parcel of land and premises hereinafter particularly described, situate, lying and being in the Borough of Carteret, in the County of Middlesex and State of New Jersey, known and designated as Lot No. 17 in Block 10 Plate 9 of the tax duplicate of said Borough of Carteret assessed as three and twenty-five hundredths (3.25) acres and having a width of approximately three hundred sixty-eight and twenty-eight hundredths (368.28) feet on the northerly and southerly sides and approximately four hundred forty-five and fifty hundredths (445.50) feet on the Easterly and Westerly sides thereof.

Being the same premises conveyed to the Grantor herein from Henry C. Little and Bruce L. Little, his wife, by deed dated January 6, 1938 and recorded in the Widdlesex County Clerk's Office in Deed Book 1263 on Page 306 on August 1, 1944.

TRACT V

FIRST PARCEL: BEGINNING at a point 2258 feet and 54 hundredths of a foot measured on a course of north 40 degrees 33 minutes 50 seconds east from a point in the center line of the Carteret Extension Rallroad distant in said center line of said railroad on a course of south 49 degrees 26 minutes 10 seconds east 2116 feet and 75 hundredths of a foot from a stone monument located at the point of intersection in said center line of said railroad which said point of intersection is situated on a line bearing south 47 degrees 51 minutes 30 seconds east 2438 feet and one tenth of a foot from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) north 48 degrees 15 minutes 20 seconds east 695 feet to the southwesterly side of Deep Creek; thence (2) south 53 degrees east 58 feet; thence (3) south 39 degrees east 47 feet; thence (4) south 20 degrees east 151 feet; thence (5) south 34 degrees east 57 feet and 5 tenths of a foot; thence (6) south 48 degrees 36 minutes 20 seconds west 519 feet and 5 hundredths of a foot to the northeasterly side of Ned's Creek; thence (7) north 51 degrees 20 minutes west 35 feet and 5 tenths of a foot; thence (8) north 55 degrees 30 minutes west 53 feet; thence (9) north 57 degrees 25 minutes west 97 feet; thence (10) north 56 degrees west 41 feet; thence (11) north 69 degrees west 19 feet; thence (12) north 78 degrees west 18 feet and 5 tenths of a foot; (13) north 87 degrees west 66 feet to the place of thence BEGINNING.

The 2nd course to the 5th course, both inclusive, run

along the southwesterly side of Deep Creek.

The 7th course to the 13th course both inclusive, run . along the northeasterly side of Ned's Creek.

Containing within the lines as hereinbefore described

4.118 acres.

SECOND PARCEL: BEGINNING at a point 2716 feet and 69 hundredths of a foot measured on a course of north 40 degrees 33 minutes 50 seconds east from a point in the center line of the Carteret Extension Railroad, distant in said center line of said Railroad in a course of south 49 degrees 26 minutes 10 seconds east 1589 feet and 45 hundredths of a foot from a stone monument located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing south 47 degrees 51 minutes 30 seconds east 2438 feet and one tenth of a foot from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) north 68 degrees 40 minutes 40 seconds east 429 feet to the westerly side of Deep Creek; thence (2) south 26 minutes east 80 feet and 9 hundredths of a foot; thence (3) south 25 degrees 20 minutes east 143 feet; thence (4) south 41 degrees east 153 feet; thence (5) south 45 degrees east 84 feet; thence (6) south 48 degrees 15 minutes 20 degrees east 84 feet; thence (6) south 45 degrees 15 minutes 20 seconds west 698 feet and 4 hundredths of a foot to the center of Ned's Creek; thence (7) through the center of Ned's Creek south 82 degrees west 7 feet and 67 hundredths of a foot; thence (6) still along the center of Ned's Creek south 74 degrees west 9 feet to the center of an unnamed creek; thence (9) north 22 degrees west 47 feet; thence (10) north 32 degrees west 18 feet; thence (11) north gest; thence (10) north 32 degrees west 18 feet; thence (11) north 9. degrees west 55 feet; thence (12) north 18 degrees 30 minutes west 87 feet; thence (13) north 1 degree west 27 feet; thence (14) north 29 degrees west 102 feet; thence (15) north 32 degrees west 48 feet and 5 tenths of a foot; thence (16) north 13 degrees east 32 feet; thence (17) north 33 degrees east 63 feet; thence (18) north 48 degrees east 33 feet and 5 tenths of a foot; thence (19) north 72 degrees 30 minutes east 78 feet and 7 hundredths of a foot; thence (20) north 21 degrees 56 minutes west 230 feet and 27 hundredths of a foot to the place of EWHITMING. hundredths of a foot to the place of BEGINNING.

The 9th to the 18th course both inclusive run through the

center of an unnamed creek hereinabove mentioned.

Containing within the lines as above described 6.962

acres.

Being the same premises conveyed to the Grantor herein from Communipaw Central Land Company, by deed dated February 13, 1939 and recorded in the Middlesex County Clerk's Office in Deed Book 1171 on Page 177 on June 10, 1940.

TRACT VI

BEGINNING at the junction of two forks of Oyster Creek, which point of beginning is distant from the point where said Oyster Creek empties into Deep Creek, the following courses and distances measured along Oyster Creek from said last mentioned point, north seventy-eight (78) degrees forty-nine (49) minutes west one hundred and twenty-six feet (126); thence south seventy-eight (78) degrees fifty-seven (57) minutes west two hundred and eight (208) feet; running thence from said point of beginning (1) along the center line of the northerly fork of Oyster Creek, north fifty-eight (58) degrees twenty-six (26) minutes west thirty-two (32) feet; thence (2) still along the same north eighty-six (86) degrees twenty-one (21) minutes west twenty-nine (29) feet; thence (3) still along the same north sixty-three (63) degrees west one hundred and twelve (112) feet; thence (4) still along the same north twenty-six (26) degrees forty (40) minutes west thirty-nine feet and seventy-five one-hundredths of a foot (39.75); thence (5) still along the same north thirty-five (35) degrees three (3) minutes west thirty-five feet and ninety one-hundredths of a foot (35.90); thence (6) south fifty-one (51) degrees twenty-six (26) minutes twenty (20) seconds west four hundred and forty-six feet and eighty-two one-hundredths of a foot (446.82) to the southerly fork of said Oyster Creek; thence (7) running along said southerly fork of said Oyster Creek to the place of BEGINNING.

Being the same premises conveyed to the Grantor herein from Henry C. Little and Bruce L. Little, his wife, by deed dated October 15, 1945 and recorded in the Middlesex County Clerk's Office in Deed Book 1287 on Page 361 on October 23, 1945.

TRACT VII

ALL that certain tract or parcel of land and premises BEGINNING at a point one thousand six hundred and thirty-nine feet and ninety-seven hundredths of a foot measured on a course of North 40 degrees 33 minutes 50 seconds East from a point in the center line of Sound Shore Extension Railroad, also known as Carteret Extension Railroad, distant in said center line of said Railroad on a course of South 49 degrees, 26 minutes 10 seconds East one thousand one hundred eighty-eight feet and eighty-seven hundredths of a foot from a stone monument, located at the point of intersection in said center line of said Railroad, which said point of intersection is situated on a line bearing South 47 degrees 51 minutes 30 seconds East two thousand four hundred thirty-eight feet and one tenth of a foot from another stone monument located at the beginning of said course and distance and being in the center line of the Elizabethport and Perth Amboy Branch of the Central Railroad Company of New Jersey; thence running (1) North 2 degraes 28 minutes 20 seconds East two hundred twenty-two feet; thence (2) North 72 degrees East one thousand fifty feet and seventy-six hundredths of a foot; thence (3) South 21 degrees 56 minutes East two hundred eighteen feet and forty-seven hundredths of a foot; thence (4) South 72 degrees 30 minutes West one thousand one hundred forty-three feet and forty-four hundredths of a foot to the place of BEGINNING.

Being the same premises conveyed to the Grantor herein from Harry A. Bostrom and Ruth L. Bostrom, his wife, by deed dated November 10, 1939 and recorded in the Middlesex County Clerk's Office in Deed Book 2379 on Page 529 on December 7, 1962.

TRACT VIII

PIRST PARCEL: BEGINNING at a large stone at corner to lands of Tremley Point Corporation and lands of James Compton and also being a corner of lands formerly of Isaac Lambert; running (1) along line of lands of Tremley Point Corporation North 77 degrees 52 minutes East 421.70 feet to a point in the westerly line of Rahway River; thence (2) along the westerly line of said Rahway River in a southerly direction 450 feet more or less to a point in line of lands formerly of one Enders; thence running (3) along line of lands of said Enders North 71 degrees 50 minutes West 483 feet to point in line of lands formerly of James Compton; thence running (4) along line of lands of said Compton North 17 degrees 40 minutes East 221.92 feet to place of BEGINNING. Containing 3,340 acres.

SECOND PARCEL: All that parcel or piece of salt meadow situate, lying and being in Woodbridge Rahway Meadow on an island in said Meadow containing 8.10 acres butted and bounded as follows: BEGINNING at the southeast corner of meadow now or formerly belonging to Solomon Hunt near a branch of Deep Creek; from thence running with said Hunt's line 8 chains 88 links to a stone planted for a corner of a parcel of meadow released to David Dunham in trust for his children; thence with said David Duncan's line south 84 degrees' 30 minutes East 5 chains 55 links to Rahway River; thence down along said River to mouth of said Creek; thence up along said Creek or branch of Deep Creek to the BEGINNING. Being butted westerly by Solomon Hunt's meadow, northerly by the said parcel of meadow released to said David Dunham, east by Rahway River and southerly by said branch of Deep Creek.

THIRD PARCEL: All that certain piece and parcel of salt marsh or meadow and containing 2½ acres of land more or less situate and being in Moodbridge Rahway Meadows, it being part of Cattan Meadow, of which conveyance was made to John De Camp, deceased, and in a division of the Estate of John D. Camp deceased, unto his son Morris D. Camp and from said Morris D. Camp to Thomas Marsh bounded and described as follows: BEGINNING at a stake or stone planted by the Rahway River being the northwest corner of a tract of salt meadow formerly belonging to Hugh Marsh now in possession of James Hunt; thence running South 2 chains 40 links to a stake or stone planted in said Hunt's line; thence North 80 degrees 45 minutes West 8 chains 94 links to a stake or stone; thence North 2 chains 80 links to said River; thence easterly down said River to place of BEGINNING. Containing 2½ acres as aforesaid more or less.

FOURTH PARCEL: Bounded southerly and westerly by Deep Creek at its junction with Rahway River; Northerly and easterly by Rahway River and southeasterly by meadow of John C.D. Camp. Containing about 4 acres more or less.

FIFTH PARCEL: BEGINNING at a stone planted by the Deep Creek which is a corner of Lambert De Camp; thence North 62 degraes 35 minutes East 7 chains 9 links to a stone by Rahway River; thence South 34 degrees 70 minutes East along River 5 chains 34 links to a stake corner of John Moore, Estate; thence North 57 degrees East 6 chains 97 links to a stake by aforesaid Creek; thence North 45 degrees 30 minutes West 4 chains 44 links to a stake; thence North 16 degrees 30 minutes West 2 chains 53 links along Creek to BEGINNING.

Bounded mortherly by Da Camp; Easterly by said River; South by said John Moore; West by aforesaid Creek.

SIXTH PARCEL: BEGINNING at a stake planted by the Deep Creek; from thence running East North East 7 chains to Rahway River; thence as the River runs and binding thereon 6 chains to a stake; thence 56 degrees West 7 chains to a stake planted at the Deep Creek; thence as the said Creek runs and binding thereon 6 chains to BEGINNING. Containing J acres more or less.

SEVENTH FARCEL: Being all that tract of salt meadow which lies adjacent to and southerly of the tract described in a

deed from Betsey Bullman, Executrix to Levi Darby by deed dated August 9, 1873 and Northerly of a tract of salt meadow land containing 4 22/100 acres conveyed by Peter B. Amory to Levi Douglass Darby, otherwise Douglass L. Darby by his deed dated March 14, 1887 and Westerly by Deep Creek and Easterly by the Rahway River. Said to contain 4 acres.

EIGHTH PARCEL: BEGINNING at a point on the easterly bank of the Rahway River being the westerly corner of the tract hereby conveyed and the most northerly corner of land now or formerly of James Compton; thence running South 41 degrees 45 minutes East 726.4 feet along land now or formerly of James Compton to a stone and corner of land of Isaac Lambert; thence along said land of Isaac Lambert North 77 degrees 52 minutes East 421.70 feet to the Bank of the Rahway River (being at this point the westerly bank of said River) thence along said River following its various courses northerly, westerly and southerly to the point and place of BEGINNING. Containing 9.042 acres.

NINTH PARCEL: BEGINNING at a stake planted by the edge of the Rahway River at a corner of meadow set off to Violetta Marsh widow of Solomon Marsh, deceased; thence running with the division line of said Violetta Marsh South 58 degrees 15 minutes East 9 chains or thereabouts to a stake or stone planted in line of meadow formerly belonging to John Enders, et als; thence South 5 degrees West 10 chains 26 links to a stone planted near the edge of a small worm or creek; thence along up said worm and low sedge meadow adjoining former Thomas Morris' line until it comes to the edge of

the Rahway River; thence up said River its various courses to the place of BEGINNING. Containing 5.18 acres more or less.

Bounded northerly by meadow set off to said Violetta Marsh, now deceased, westerly by Rahway River meadow now or formerly of Thomas Morris deceased, and a worm or creek, southerly by said worm or creek and easterly by meadow formerly of John Rahders et als.

Enders et als.

TENTH PARCEL: Being known as the Baker Meadow, bounded on the north by lands belonging to Thomas Morris, East by lands of B. Radley, on the south by unknown parties, wast by Aaron Shotwell and lying on Deep Creek, also near the Rahway River. This tract is also known as the Cornelius Baker lot and is said to contain 4½ acres more or less.

A lot of salt meadow situate in ELEVENTH PARCEL: Woodbridge Township, Rahway Meadows, containing 2½ acres more of less bounded southeast by Cross Creek, south by meadow now or late of Aaron Cloton, deceased west by meadow now or late of Samuel Jacques and north by meadow now or late of Thomas Alston.

ALSO all of the following lots, whether wartially included in the foregoing descriptions or not; whether wholly or

All of Lot 21 in Block 9;

All of Lots 12, 13, 14 and 16 in Block 10;

All of Lots 8 and 28 in Block 11 as shown and designated on the Assessment Maps of the Borough of Carteret in use on January 14, 1943, said lots being shown on Sheets 9 and 10 of said Maps which bear the legend "Borough of Roosevelt, Middlesex County, New Jersey Scale 1"-200' Aug. 1918 F.F. Simons, Certeret N.J."

Also all the right, title and interest of the Grantor herein in Lot 11, Block 11 as shown on said Maps.

Being the same premises conveyed to the Grantor herein from Richfield Realty Corporation by dead dated January 14, 1943 and recorded in the Middlesex County Clerk's Office in Deed Book 1231 on Page 517 on January 22, 1943.

#### SCHEDULE B

### Easements, Covenants, Restrictions and Other Encumbrances

- Current taxes not due and payable.
- 2. Municipal zoning ordinances and other applicable federal, state and local laws, ordinances, regulations and requirements.
- 3. Any facts about the Property which would be disclosed by an accurate survey of the Property.
- 4. No Further Action Letter and Covenant Not to Sue issued by the New Jersey Department of Environmental Protection on September 24, 2002.
- 5. Declaration of Environmental Restrictions dated April 26, 1995 and recorded on May 4, 1995 in Book 4236, Page 348.
- 6. Access Agreement to be entered into between the Seller and the Buyer as of the Closing Date as contemplated by the within Agreement.
- 7. Restrictions contained in the deed dated August 17, 1999 from Cytec Industries, Inc. to the Seller and recorded on September 15, 1999 in Deed Book 4683, Page 327.
- 8. Easement dated July 26, 1938 by Richfield Realty Corporation to Carbide and Carbon Chemicals Corporation and recorded on September 7, 1938 in Book 1139, Page 53.
- 9. Covenants and restrictions contained in the Administrative Consent Order dated September 5, 1990 between the New Jersey Department of Environmental Protection and American Cyanamid Company, recorded on November 5, 1990 in Book 4114, Page 25, as amended by an Amendment thereto dated July 6, 1993, which was recorded in Book 4114, Page 53.
- 10. Restrictive Covenant dated as of December 17, 1993 by American Cyanamid Company and Cytec Industries Inc. and recorded on December 23, 1993 in Book 4116, Page 242.
- 11. Easement Agreement dated December 5, 2006 by Titan PDC Carteret Urban Renewal, LLC to the Seller and recorded on January 17, 2007 in Book 5773, Page 128.
- 12. Any and all matters relating to tidelands, riparian rights or wetlands.



# State of New Jersey SELLER'S RESIDENCY CERTIFICATION/EXEMPTION (C.55, P.L. 2004)

(Blesse Brist or Time)

	SOCCOUNT.	Int or Type)							
	SELLER	R(S) INFORMATION (See Instructions, Page	ge 2)	1.13 m/s	and the same of th				
	Name(s	Name(s)							
	Carteret	Carteret Development LLC							
	Current Resident Address:								
	Street; F	ive Garret Mountain Plaza			7-0-4				
	City, To	wn, Post Office		State	Zip Code				
	Woodlan	d Park		NJ	07424				
	PROPE	RTY INFORMATION (Brief Property Descri	ription)						
	Block(s)		Lot(s)		Qualifier				
	Block 9.	03, Lot 21, Block 10, Lots 8-10, 12-21, Block 11.	01, Lots 8, 10-14 and 28						
	Street A	ddress:							
					The Control				
	City, To	wn, Post Office		State	Zip Code				
	Cartere	at	/	NJ	07008				
		Percentage of Ownership	Consideration		January   5 , 2010				
	100%	R ASSURANCES (Check the Appropriate	\$2,500,000	2 apply to R					
	SELLER								
ır.	1.	I am a resident taxpayer (individual, estate, or i will file a resident gross income tax return and property.	trust) of the State of New Jer pay any applicable taxes of	rsey pursuant to any gain or in	to N.J.S.A. 54A:1-1 et seq. and accome from the disposition of this				
	The real property being sold or transferred is used exclusively as my principal residence within the meaning of section 121 of the federal internal Revenue Code of 1986, 26 U.S.C. s. 121.								
	<ol> <li>I am a mortgagor conveying the mortgaged property to a mortgagee in foreclosure or in a transfer in lieu of foreclosure with no additional consideration.</li> </ol>								
	5. Seller, transferor or transferee is an agency or authority of the United States of America, an agency or authority of the State of New Jersey, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage Insurance company.								
IGIN/	5. <b>X</b>	<ol> <li>Seller is not an individual, estate or trust and as such not required to make an estimated payment pursuant to N.J.S.A.54A:1-1 et seq.</li> </ol>							
ILLEGIBLE ORIGINAL Middlesex County Clerk	6. 🔼	<ol> <li>The total consideration for the property is \$1,000 or less and as such, the seller is not required to make an estimated payment pursuant to N.J.S.A. 54A:5-1-1 at seq.</li> </ol>							
	7. The gain from the sale will not be recognized for Federal Income tax purposes under I.R.C. Section 721, 1031, 1033 or is a cemetery plot. (CIRCLE THE APPLICABLE SECTION). If such section does not utilimately apply to this transaction, the soller acknowledges the obligation to file a New Jersey Income tax return for the year of the sale (see Instructions).								
ig in		No non-like kind property received.							
= 2	8. 🗖	Transfer by an executor or administrator of a di accordance with the provisions of the decedent	ecedent to a devisee or heir t's will or the intestate laws t	to effect distri of this state.	button of the decedent's estate in				
	SELLE	R(S) DECLARATION							
	The undersigned understands that this declaration and its contents may be disclosed or provided to the New Jersey Division of Taxation and that any false statement contained herein could be punished by fine, imprisonment, or both. I furthermore declare that I have examined this declaration and, to the best of my knowledge and belief, it is true, correct and complete.								
		January 15, 2010		1	1				
		Date	(Seller) Please Ind	Signature icate if Power of A	ttomay or Attorney in Fact				
	7	Date	(Seller) Please Ind	Signature losts it Power of Al	tomsy or Attorney in Fact				

RTF-1EE (Rev. 7/08)

STATE OF NEW JERSEY

MUST SUBMIT IN DUPLICATE

CATE AFFIDAVIT OF CONSIDERATION FOR USE BY BUYER
(Chapter 49, P.L. 1968, as amended through Chapter 33, P.L. 2006) (N.J.S.A. 46:15-5 et seq.)

BEFORE COMPLETING THIS AFFIDAVIT, PLEASE READ	THE INSTRUCTIONS ON THE REVERSE SIDE OF THIS FORM
STATE OF NEW JERSEY	FOR RECORDER'S USE ONLY
SS. County Municipal	Code Consideration \$
COUNTY Morris 120	RTF paid by buyer \$ By
MUNICIPALITY OF PROPERTY LOCATIONCARTERET	
1) PARTY OR LEGAL REPRESENTATIVE (See Instructions #3 a	nd #4 on reverse side) xxx-xx-x 428
	Last 3 Digits in Grantee's Social Security Number
(Name)	duly sworn according to law upon his/her oath,
deposes and says that he/she is the Manager (Grantee, Legal Representative, Corporate Officer, Officer of Titl	
real property identified as Block number 9.03 Lot21 Block10	Lot number 8-10 and 12-21 and Block 11.01 located at
Salt Meadows, Carteret	and annexed thereto.
(Street Address, Town)	
2) <u>CONSIDERATION</u> \$ 2,500,000.00 (	See Instructions #1, #5, and #11 on reverse side)
Entire consideration is in excess of \$1,000,000:	
PROPERTY CLASSIFICATION CHECKED BELOW SHOULD B	E TAKEN FROM THE OFFICIAL TAX LIST (A PUBLIC RECORD)
(A) When Grantee is required to remit the 1% fee, comple	
	_
Class 2 - Residential Class 3A - Farm property (Regular) and any	Class 4A – Commercial Properties  (if checked, calculation on (C) required below)
other real property transferred to same grantee	Class 4C - Residential Cooperative Unit
in conjunction with transfer of Class 3A propert	y (4 Families or less)
(B) When Grantee is not required to remit the 1% fee, of	complete below:
Property class. Circle applicable class(es):	1 4B 4C 15
Property classes: 1-Vacant Land, 4B-Industrial properties,	APApartments (other than cooperative unit), 15-Public Property
Exempt Organization pursuant to federal Internal Incidental to corporate merger or acquisition a	nd equalized assessed valuation less than 20% of total value of
all assels exchanged in merger or acquisition ( COMPLETED RTF-4)	If checked, calculation in (C) below required and MUST ATTACH
(C) REQUIRED CALCULATION OF EQUALIZED AS PROPERTY TRANSACTIONS: (See Instructions)	SSESSED VALUATION FOR ALL CLASS 4A COMMERCIAL
Total Assessed Valuation + Director's Ratio = Equa	
\$+	
f Director's Ratio is less than 100%, the equalized valuation will be	e an amount greater than the assessed valuation. If Director's Ratio
s equal to or in excess of 100%, the assessed valuation will be equal to or in excess of 100%, the assessed valuation will be equal to or in excess of 100%, the assessed valuation will be equal to or in excess of 100%, the assessed valuation will be equal to or in excess of 100%, the assessed valuation will be equal to or in excess of 100%.	ual to the equalized value.
3) TOTAL EXEMPTION FROM FEE (See Instruction #8 on revers	
Deponent states that this deed transaction is fully exempt from through C. 66, P.L. 2004, for the following reason(s). Mere referent	he Realty Transfer Fee imposed by C. 49, P.L. 1968, as amended be to exemption symbol is insufficient. Explain in detail.
4) Deponent makes Affidavit of Consideration for Use by Buyer	to induce county clerk or register of deeds to record the deed and
accept the fee submitted herewith pursuant to the provisions of Ch	
Subscribed and sworn to before me	Rahway Arch Properties, LLC
his 15 day of January , 20 10 Signatu	re of Deponent Grantee Name
7 Nottingham D	r, Florham Park 7 Nottinham Dr. Florham Park
	nent Address Grantee Address at Time of Sale
04 / 6	
LOUIS I. KARP, ESQ.	Name/Company of Settlement Officer
ATTORNEY AT LAW	FOR OFFICIAL USE ONLY Instrument Number County
IN THE STATE OF NEW JERSEY	Deed Number Book Page
L	Deed Dated Date Recorded
County Recording Officers shall forward one copy of each Aff	idavit of Consideration for Use by Buyer recorded with deeds to:

STATE OF NEW JERSEY- DIVISION OF TAXATION

PO BOX 251 TRENTON, NJ 08695-0251

ATTENTION: REALTY TRANSFER FEE UNIT

The Director of the Division of Taxation in the Department of the Treasury has prescribed this form as required by law, and it may not be aftered or amended without prior approval of the Director. For further information on the Realty Transfer Fee or to print a copy of this Affidavit, visit the Division of Taxation website at www.state.nj.us/treasury/taxation/lpt/localtax.shtml Preliminary Assessment Rahway Arch Properties Site, Carteret, New Jersey

# APPENDIX C PHOTOGRAPHS OF SITE CONDITIONS

# Preliminary Assessment of the Rahway Arch Site Carteret, New Jersey



Typical view of site and berms



Berm with tree growth

# Preliminary Assessment of the Rahway Arch Site Carteret, New Jersey



Impoundment 6 containing standing water on alum/YSP sludge



Impoundment 6 containing standing water on alum/YSP sludge

# Preliminary Assessment of the Rahway Arch Site Carteret, New Jersey



Stockpile of excess railroad ties



Closeup of stockpile of excess railroad ties

# Preliminary Assessment of the Rahway Arch Site Carteret, New Jersey



Area of Impoundment 2 formerly occupied by Class B Recycling Facility



Monitoring well cluster CRT-1

# Preliminary Assessment of the Rahway Arch Site Carteret, New Jersey



**Monitoring Well Cluster CRT-2** 



**Monitoring well cluster CRT-3** 

# Preliminary Assessment of the Rahway Arch Site Carteret, New Jersey



**Monitoring Well Cluster CRT-6** 



**Monitoring well cluster CRT-7** 

Preliminary Assessment Rahway Arch Properties Site, Carteret, New Jersey

# APPENDIX D SANBORN FIRE INSURANCE SEARCH REPORT

### **Rawhay Arch Site**

Former American Cyanamid Landfill Carteret, NJ 07008

Inquiry Number: 2792865.3

June 14, 2010

# **Certified Sanborn® Map Report**



### **Certified Sanborn® Map Report**

6/14/10

Site Name: Client Name:

Rawhay Arch Site Former American Cyanamid Carteret. NJ 07008 EastStar Env. Group, Inc. 10280 Old Columbia Road Columbia, MD 21046

EDR Inquiry # 2792865.3 Contact: AL Free



The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by EastStar Env. Group, Inc. were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

### Certified Sanborn Results:

Site Name: Rawhay Arch Site

Address: Former American Cyanamid Landfill

City, State, Zip: Carteret, NJ 07008

**Cross Street:** 

**P.O.** # H019-01 **Project:** H019

Certification # 4EB5-4899-BEFD



Sanborn® Library search results Certification # 4EB5-4899-BEFD

### UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

Library of Congress

University Publications of America

✓ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Preliminary Assessment Rahway Arch Properties Site, Carteret, New Jersey

# APPENDIX E HISTORICAL AERIAL PHOTOGRAPHS

### **Rawhay Arch Site**

Former American Cyanamid Landfill Carteret, NJ 07008

Inquiry Number: 2792865.5

June 14, 2010

# The EDR Aerial Photo Decade Package



### **EDR Aerial Photo Decade Package**

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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### **Date EDR Searched Historical Sources:**

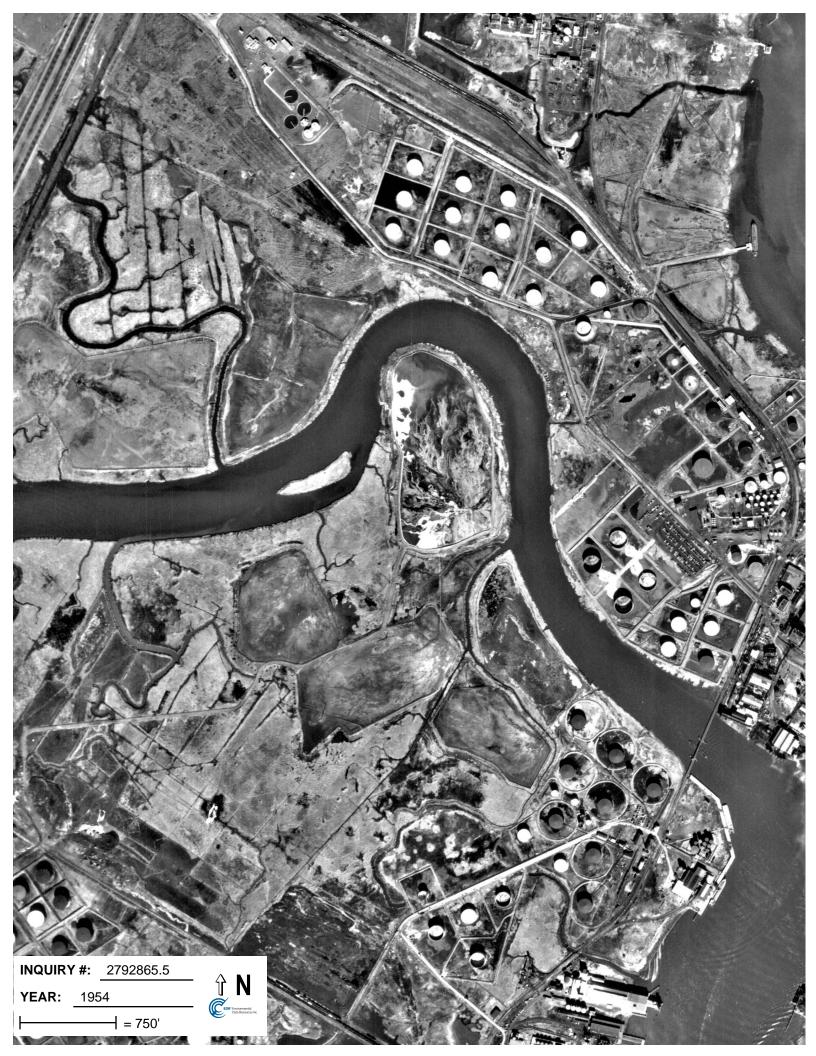
Aerial Photography June 14, 2010

### **Target Property:**

Former American Cyanamid Landfill Carteret, NJ 07008

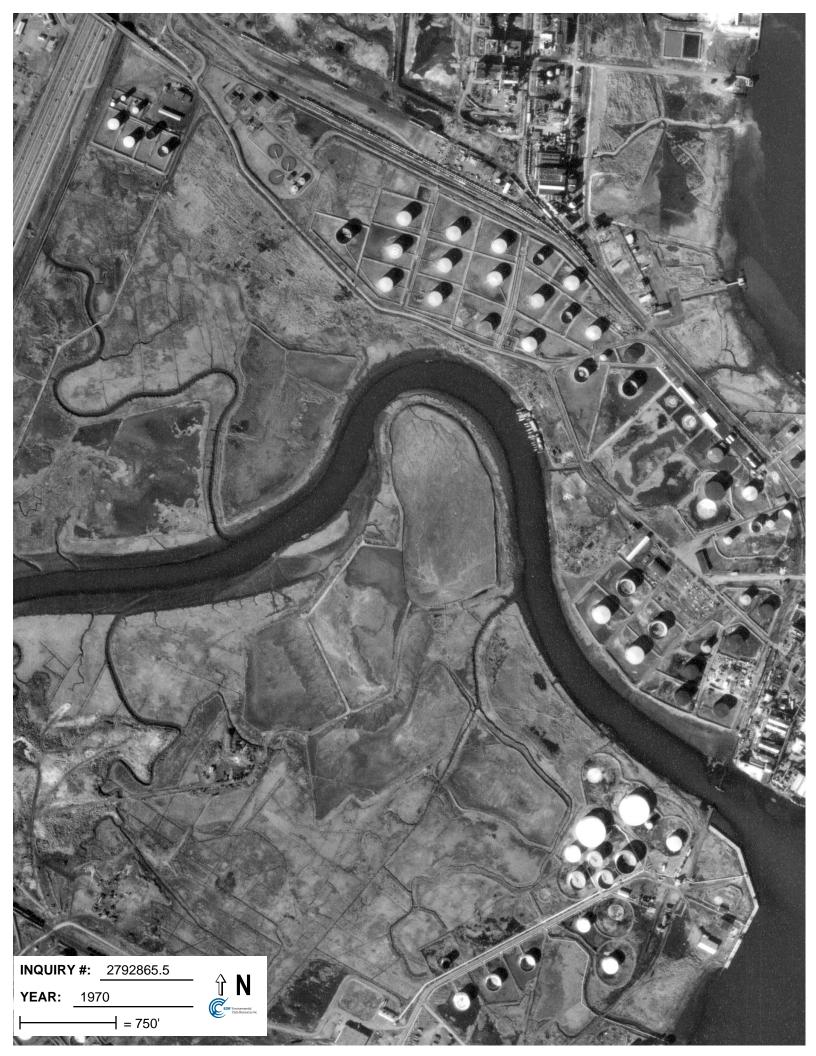
<u>Year</u>	<u>Scale</u>	<u>Details</u>	<u>Source</u>
1943	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: December 23, 1943	EDR
1954	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: February 18, 1954	EDR
1963	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: May 04, 1963	EDR
1966	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: February 22, 1966	EDR
1970	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: February 23, 1970	EDR
1978	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: June 06, 1978	EDR
1984	Aerial Photograph. Scale: 1"=1000'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: March 26, 1984	EDR
1995	Aerial Photograph. Scale: 1"=750'	Panel #: 40074-E2, Arthur Kill, NY;/Flight Date: March 29, 1995	EDR

















Preliminary Assessment Rahway Arch Properties Site, Carteret, New Jersey

# APPENDIX F HISTORICAL TOPOGRAPHIC MAPS

## **Rawhay Arch Site**

Former American Cyanamid Landfill Carteret, NJ 07008

Inquiry Number: 2792865.4

June 14, 2010

# **EDR** Historical Topographic Map Report



## **EDR Historical Topographic Map Report**

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

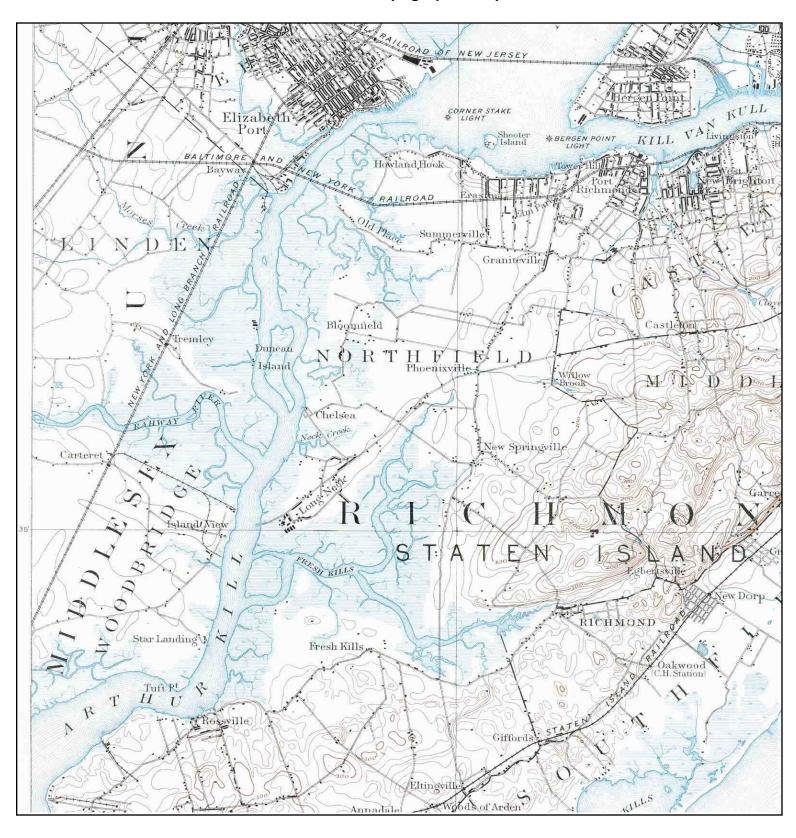
Thank you for your business.
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TARGET QUAD

NAME: STATEN ISLAND

MAP YEAR: 1891

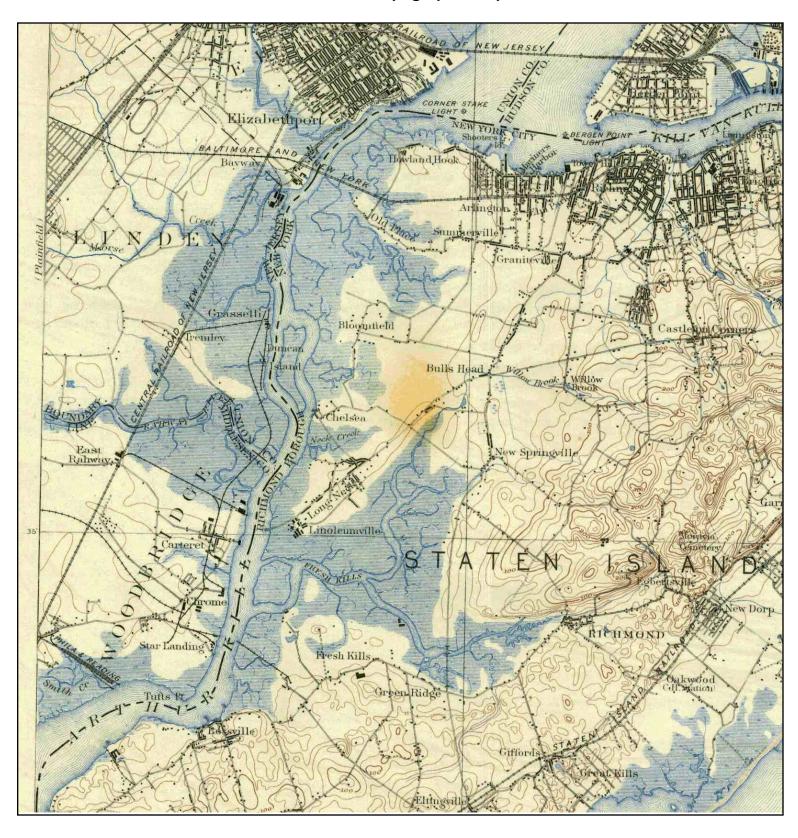
SERIES: 15 SCALE: 1:62500 SITE NAME: Rawhay Arch Site

LAT/LONG:

ADDRESS: Former American Cyanamid Landfill

Carteret, NJ 07008 40.6002 / -74.2151 CLIENT: EastStar Env. Group, Inc.

CONTACT: AL Free INQUIRY#: 2792865.4 RESEARCH DATE: 06/14/2010





TARGET QUAD

NAME: STATEN ISLAND

MAP YEAR: 1900

SERIES: 15 SCALE: 1:62500 SITE NAME: Rawhay Arch Site

LAT/LONG:

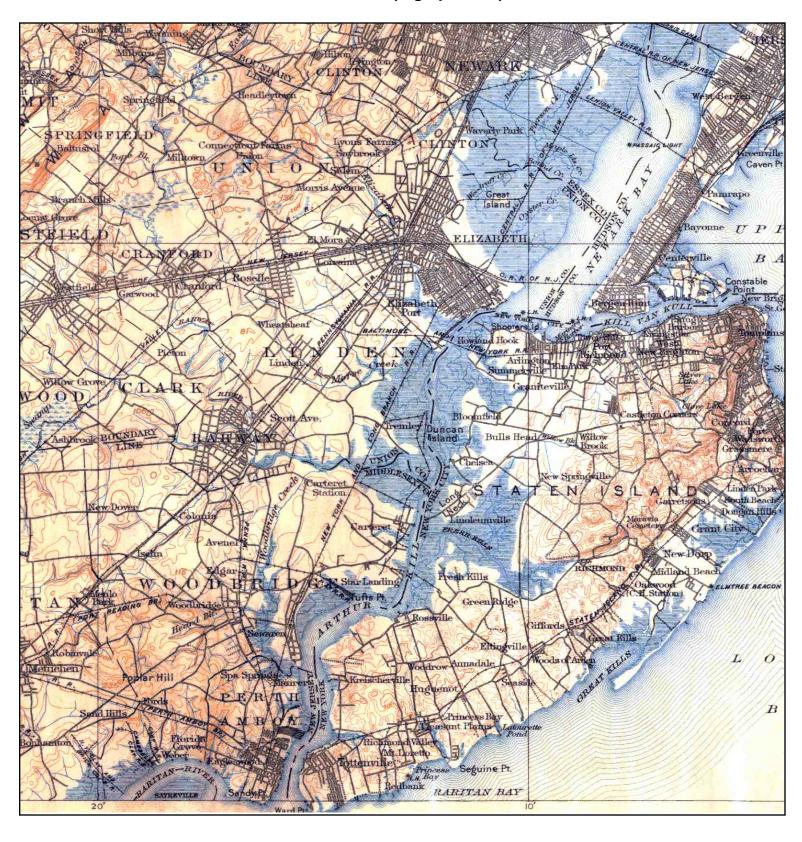
ADDRESS: Former American Cyanamid Landfill

Carteret, NJ 07008 40.6002 / -74.2151 ill CONTACT: AL Free

EastStar Env. Group, Inc.

CLIENT:

INQUIRY#: 2792865.4 RESEARCH DATE: 06/14/2010



N  TARGET QUAD
NAME: PASS

NAME: PASSAIC MAP YEAR: 1900

SERIES: 30

SCALE: 1:125000

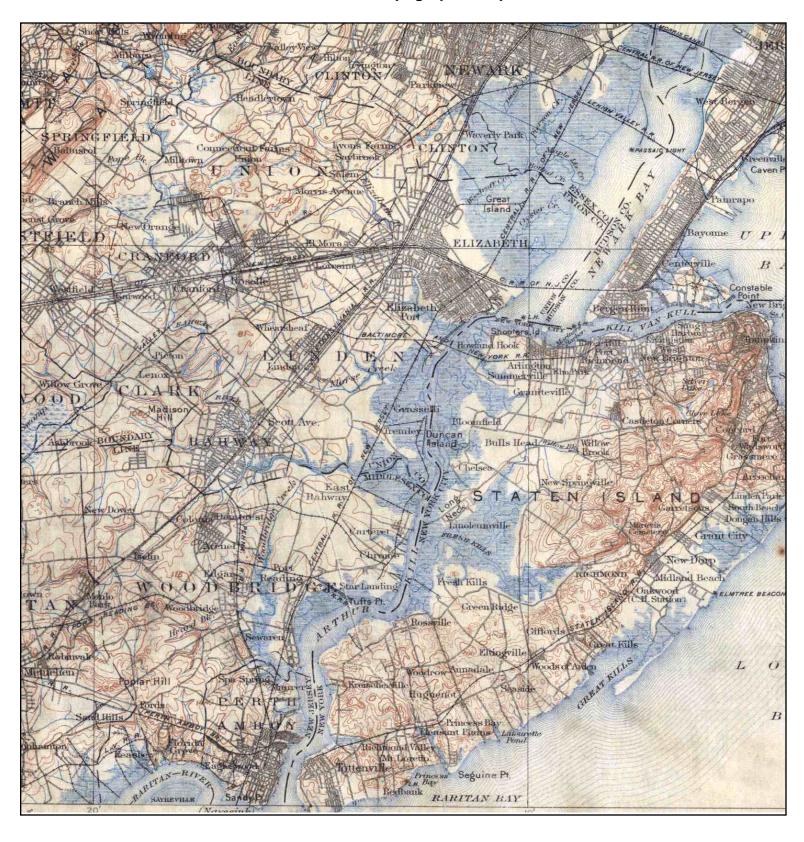
SITE NAME: Rawhay Arch Site

LAT/LONG:

ADDRESS: Former American Cyanamid Landfill

Carteret, NJ 07008 40.6002 / -74.2151 CLIENT: EastStar Env. Group, Inc.

CONTACT: AL Free INQUIRY#: 2792865.4



**TARGET QUAD PASSAIC** NAME:

MAP YEAR: 1905

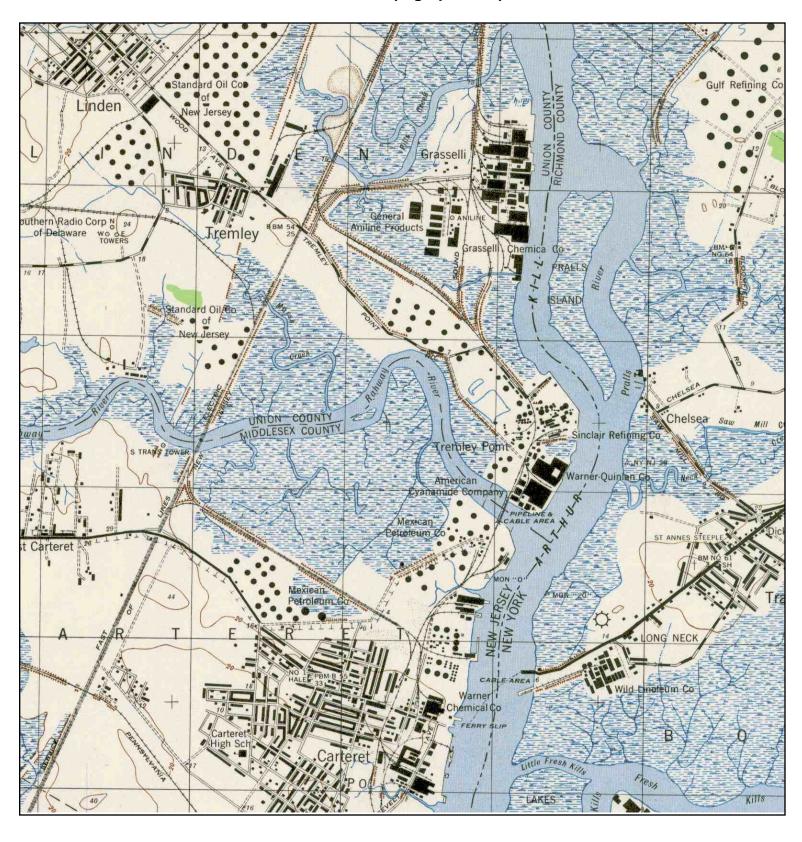
SERIES: 30 SCALE: 1:125000 SITE NAME: Rawhay Arch Site

ADDRESS: Former American Cyanamid Landfill

Carteret, NJ 07008 LAT/LONG: 40.6002 / -74.2151

CLIENT: EastStar Env. Group, Inc.

CONTACT: AL Free INQUIRY#: 2792865.4





TARGET QUAD

NAME: ARTHUR KILL

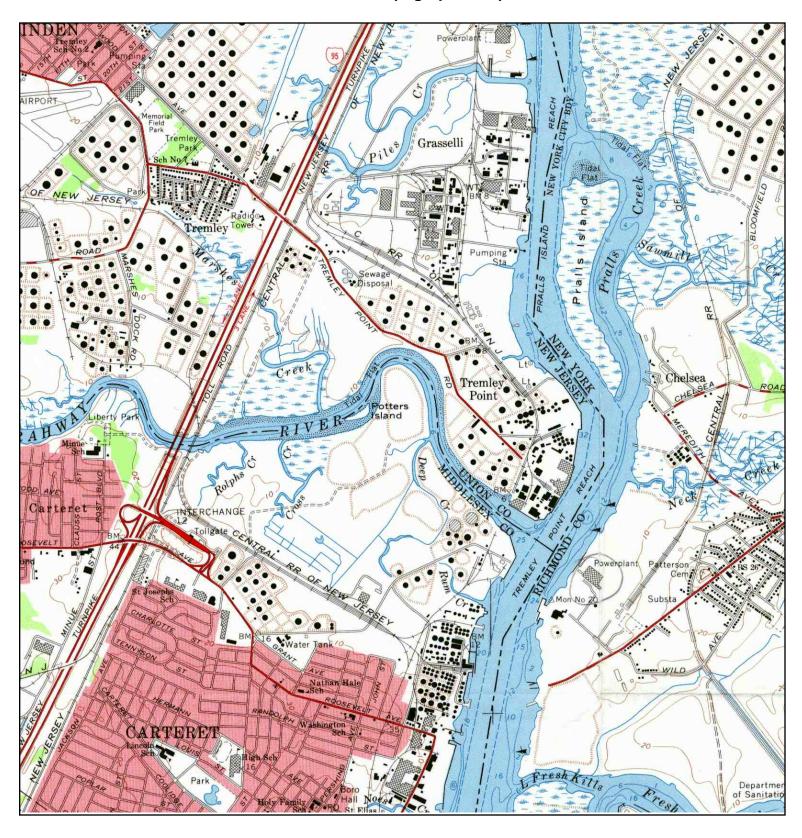
MAP YEAR: 1947

SERIES: 7.5 SCALE: 1:25000 SITE NAME: Rawhay Arch Site

ADDRESS: Former American Cyanamid Landfill

Carteret, NJ 07008 LAT/LONG: 40.6002 / -74.2151 CLIENT: EastStar Env. Group, Inc.

CONTACT: AL Free INQUIRY#: 2792865.4





TARGET QUAD

NAME: ARTHUR KILL

MAP YEAR: 1966

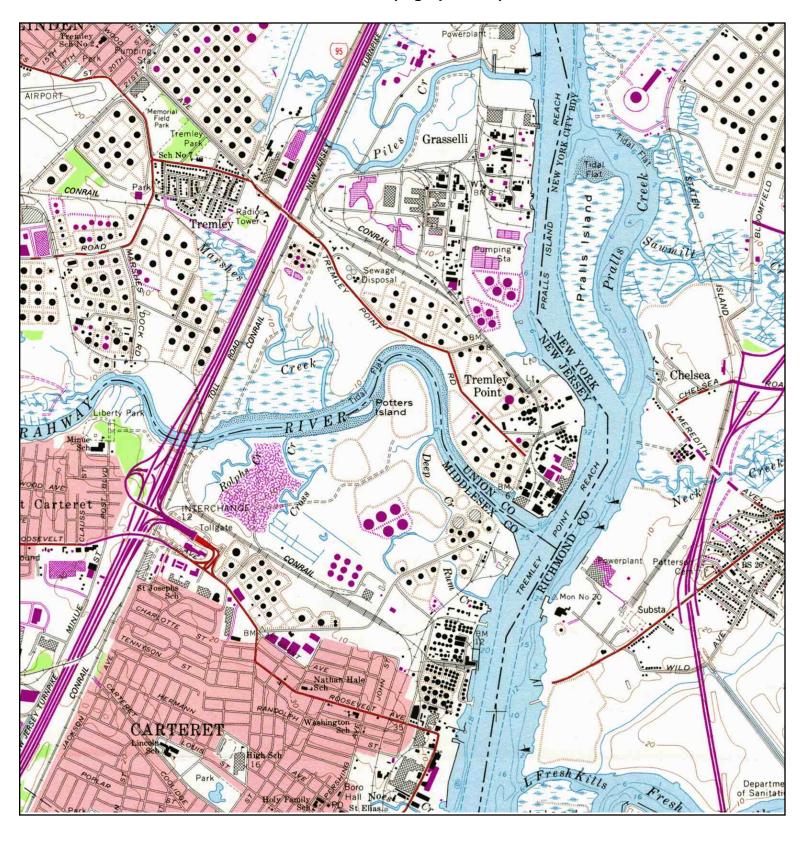
SERIES: 7.5 SCALE: 1:24000 SITE NAME: Rawhay Arch Site

LAT/LONG:

ADDRESS: Former American Cyanamid Landfill

Carteret, NJ 07008 40.6002 / -74.2151 CLIENT: EastStar Env. Group, Inc.

CONTACT: AL Free INQUIRY#: 2792865.4





TARGET QUAD

NAME: ARTHUR KILL MAP YEAR: 1981 PHOTOREVISED:1966

SERIES: 7.5 SCALE: 1:24000 SITE NAME: Rawhay Arch Site

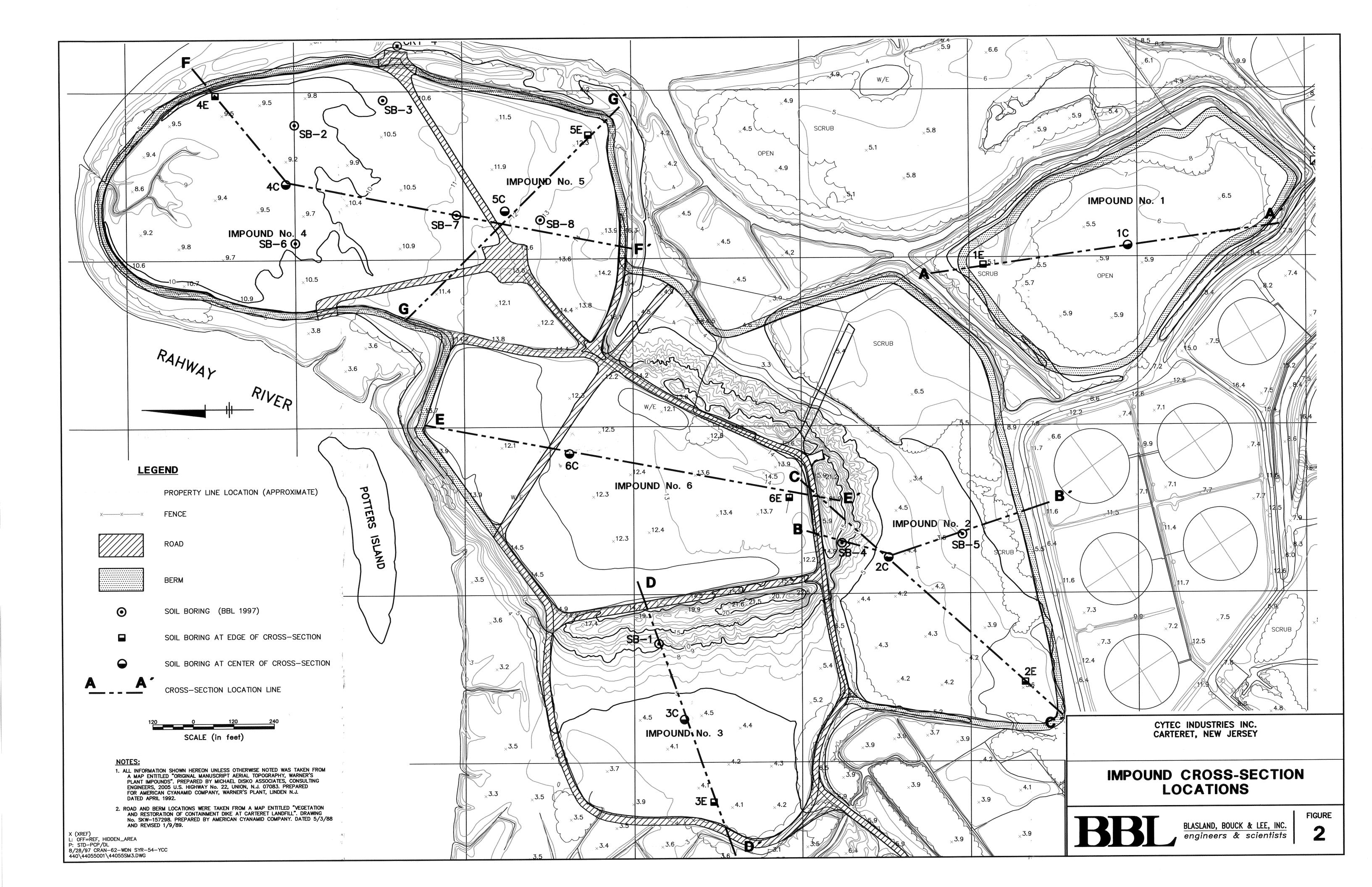
ADDRESS: Former American Cyanamid Landfill

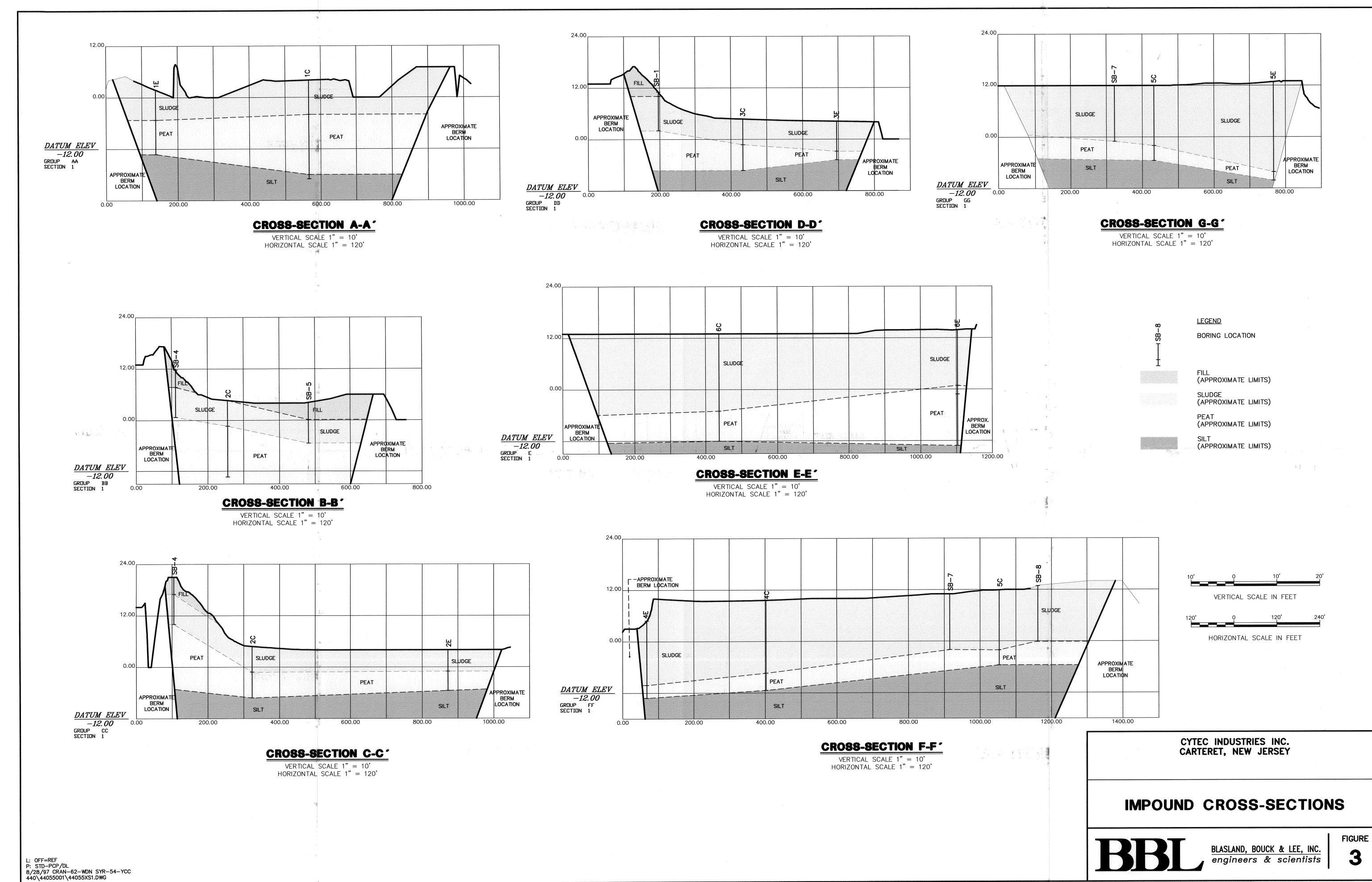
Carteret, NJ 07008 LAT/LONG: 40.6002 / -74.2151 CLIENT: EastStar Env. Group, Inc.

CONTACT: AL Free INQUIRY#: 2792865.4

Preliminary Assessment Rahway Arch Properties Site, Carteret, New Jersey

# APPENDIX G 2002 IMPOUNDMENT CROSS-SECTIONS





Preliminary Assessment Rahway Arch Properties Site, Carteret, New Jersey

# APPENDIX H WATER BUDGET CALCULATIONS

## EastStar

# Soil Safe Incorporated Rahway Arch Site Water Model

#### **HELP Model Analysis Results**

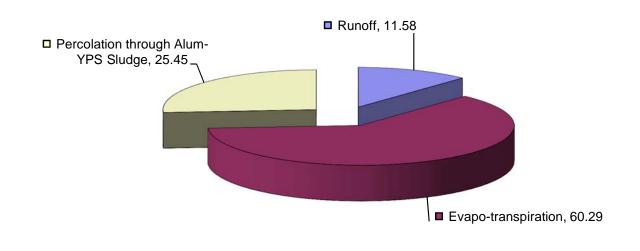
	Units	Existing Conditions		Proposed Conditions		
Fill Layer 1				Low Permeability Soil Safe Product		
Average Thickness	(ft)					1.0
Fill Layer 2				Compacted Soil Safe Product		
Average Thickness				ranges from 10 to 16 feet		
Base Layer		Alum Sludge		Alum Sludge		
Average Thickness	(ft)	varies from 8 to 13 feet		varies from 8 to 13 feet		
Surface Drainage Slope	(%)	0.5%		1.0%		
Runoff Curve Number			69.2	96.7		
	Avera	age Annual Res	ults - 5 year Si	mulation		
		Result		Results		% of Existing
		(in/yr)	(MG/yr)	(in/yr)	(MG/yr)	
Precipitation		42.80	96.1	42.80	96.1	100%
Runoff		5.16	11.6	30.27	68.0	587%
Evapo-transpiration		26.84	60.3	12.54	28.2	46.7%
Percolation through Cap				0.0171	0.0383	
Percolation through Alum-YPS Sludge		11.331	25.5	0.455	1.02	4.0%
Change in Water Storage		0.525	1.18	-0.534	-1.20	-102%

#### **Assumptions**

- 1. Existing soil is alum sludge estimated HELP Type 13, behaving like a low plasticity silty clay (CL) soil. Saturated hydraulic conductivity = 3.30x10-5 cm/s. Permeability = 0.43.
- 2. Compacted Soil Safe Product is HELP Type 26, compacted CL soil, Saturated hydraulic conductivity = 1.9x10-6 cm/s
- 3. Surface Treatment Layer is Soil Safe Product, HELP Type 26, compacted CL soil, Saturated hydraulic conductivity = 1.9x10-6 cm/s

# **EastStar**



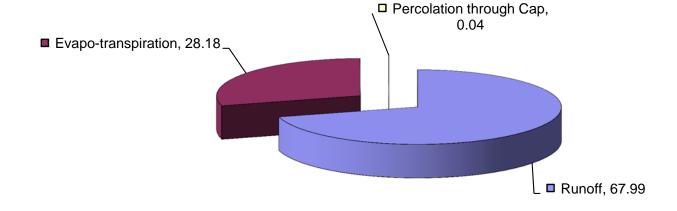


Values are annual averages, in million gallons per year, from a 5 year simulation

# **EastStar**

# Rahway Arch Site Water Balance using HELP Model

# **Remediated Site**



Values are annual averages, in million gallons per year, from a 5 year simulation